WORKSHOP

ON

DEVELOPMENT OF INSTRUCTIONAL MATERIAL

9-18 JUNE, 1969

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DEPARTMENT OF EXTENSION SERVICES
INSTITUTE OF EDUCATION FOR WOMEN

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Teaching - Learning Units

ON

General Science, Mathematics, History

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CALCUTTA-27

FOREWORD

The following pages give an account of the activities of the Workshop on preparation of Teaching-Learning Units on General Science, Mathematics and History organised by the Extension Services Department, Institute of Education for Women, Alipore, Calcutta-27 in collaboration with the members of staff of David Hare Training College, Calcutta and Bureau of Educational and Psychological Research, Calcutta from 9th to 18th June 1969, during the Summer Vacation 1969.

These subjects were actually selected by the teachers of schools concerned for improvement of the quality of teaching in Secondary Schools in those particular fields of learning. In the workshop the courses of studies prescribed in the existing syllabus of the Board of Secondary Education, West Bengal, were analysed and reviewed critically. The objectives were discussed and constructive and concrete suggestions for improvement were put forth. Different kinds of useful and interesting instructional materials were prepared and shown at the educational exhibition arranged at the end of the workshop. Altogether 19 teachers from 10 schools participated. Amongst them, 6 teachers took part in General Science, 6 in Mathematics, and 7 in History.

The Department of Extension Services takes this opportunity to render heartfelt thanks to Sri Matin Roy and Sri Satyanarayan Giri of David Hare Training College and Sm. Aparajita Ray, the Co-ordinator of Extension Services Department, Institute of Education, Sri K. K. Chatterjee of the Bureau of Educational and Psychological Research, Calcutta for acting as resource persons and rendering their most valuable services in the Workshop. The Department also thanks Sri Dibakar Mohanto, Principal, Bureau of Educational and Psychological Research, Calcutta for presiding at the valedictory function.

We earnestly expect that this account of the activities organised by the Department of Extension Services will be helpful to all field-workers who are actually engaged in the tremendous task of improving the quality of education in Secondary Schools.

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DEPARTMENT OF EXTENSION SERVICES
INSTITUTE OF EDUCATION FOR WOMEN
HASTINGS HOUSE, ALIPORE, CALCUTTA

REPORT OF THE "GENERAL SCIENCE" GROUP.

The group consisted of the following members :—

1. Sri M. K. Ray, Asstt. Professor, David Hare Training College, Calcutta—Resource Person
2. Sm. Manjula Roy Chowdhury, Asst. Teacher, Sri Ramesh Mitter Girls' Higher Secondary School, Calcutta. } Joint Recorder
3. Sm. Archana Sinha, Asst. Teacher, Sishu Vidyamandir, Calcutta. } Joint Recorder
4. Sm. Puspa Banerjee, Asst. Teacher, Chandrabhag Girls' Higher Secondary School, Bagnan.
5. Sm. Padmabati Kar, Asst. Teacher, Chandrabhag Girls' Higher Secondary School, Bagnan.
6. Sm. Kanan Das, Asst. Teacher, Khantura Girls' Higher Secondary School, 24-Parganas.
7. Sm. Mandira Sarkar, Asst. Teacher, Raipur Girls' Junior High School, Jadavpur.

The workshop on preparation of "Teaching-Learning Unit" was inaugarated on the 9th June, 1969 at 11 A.M. in the Reading Room of the Institute of Education for Women by Sm. Aparajita Ray, Co-ordinator, Extension Services Department. In her welcome address Sm. Ray explained the purpose of the workshop. This was followed by a talk on "Need for Teaching-Learning Unit" by Sri K. K. Chatterjee, Evaluatino Officer of the State Evaluation Unit. The resource persons present then discussed the significance of teaching-learning units in their respective subjects. The participants were then divided into three groups to work on preparing teaching-learning units in three school subjects—History, Mathematics and General Science.

In the afternoon session the members of the "General Science" group discussed how a teaching-learning unit can help teachers of general science in the effective organisation of their day to day work.

In the morning session of the 10th June Sri K. K. Chatterjee gave a talk on the general format of teaching-learning unit which was followed by a discussion led by the Co-ordinator Sm. Aparajita Roy. In course of the discussion questions from the participants were invited

and the resource persons dealt with the questions and problems raised by the participants in their respective subjects. This discussion was very helpful for the participants to clarify their viewpoints.

In the afternoon session the group studied the syllabi of general science at the middle school stage as an essential preliminary in formulating the instructional objectives in General Science for class VIII. During this discussion the group made certain observations on the syllabi for classes VI to VIII (the middle school stage) and these observations are recorded in this report.

From the 11th June the work of preparing a teaching-learning unit was taken up and necessary discussions were held from time to time. While selecting the unit the members of the group were of the opinion that it would be worthwhile to select the unit from that portion of the syllabus of class VIII which is yet to be covered in their schools. As the first two "units" in the syllabus have already been taught in schools by this time the third unit "Matter and Materials" was taken up, with the idea that they can give a fair trial to the plan when they will go back to their respective schools.

The unit was divided into five sub-units. The objectives in relation to each sub-unit were then formulated. Major concepts and sub-concepts were identified and activities for the pupils and teachers have been suggested in the teaching-learning unit. Although the sub-concepts are self-explanatory in some cases the background knowledge for the teacher has been outlined for ready-made reference. The members of the group will consider their efforts successful if the teachers of the subject find the "teaching-learning unit" useful in their day to day work.

We, on behalf of the members of the group, convey our heart-felt thanks to Sm. Aparajita Ray for giving us the opportunity to participate in the seminar, to Sri K. K. Chatterjee for his valuable talks and to Sri M. K. Ray and Sri P. Ghosh for their valuable guidance and help in preparing the teaching-learning unit.

On behalf of the participants
Manjula Ray Chaudhury and Archana Sinha
Joint-Recorders.

Some observations on syllabi in General Science for classes VI to VIII, prescribed by the Board of Secondary Education, West Bengal.

1. General objectives are not stated in the syllabus.

Statement of the general objectives would be of great help for the guidance of teachers and the text-book writers for effective planning of their work. These objectives may be broadly classified under at least three major heads vis—(i) knowledge and understanding, (ii) application and (iii) skill.

2. The scope of the individual topics may be well defined (i.e. the extent to which a particular topic should be studied) for better guidance for text-book writers and for the teachers.

3. As teachers of the subject we feel that an indication in regard to an inductive approach in presenting the subject matter in text-book be given for the guidance of text-book writers.

4. The arrangement of topics in a concentric manner based on childs' need, interest and ability is psychologically sound. For example, the elementary idea of air and its function in maintaining life is dealt with in class VI. In class VII the physical aspects of air like "air develops force" are introduced. The quantitative aspects of "air pressure" and the application of air pressure are introduced in class VIII. This conforms to the childs' mental development.

5. The selection of the content matter from children's immediate environment is also educationally sound. It will satisfy their curiosity and enhance better and effective adaptation to practical situation.

6. Some gaps are found in the content matter which, we feel, will stand in the way of better integration of knowledge. The group in discussing these aspects is of the opinion that certain changes be made for bridging the gaps of above nature. Suggestions in this regard are stated below.

CLASS—VI

A1. The major concept, i.e. "the concept of matter" is not related to the sub-concepts mentioned in column 2. From a scrutiny of the sub-concepts under this major concept it appears that the idea is not to develop the concept of matter but to give an elementary idea of the common materials and to identify some of them with the help of common physical characteristics like—odour, colour, texture and the like. The main objective of this unit in class VI is to offer the training of senses.

A1(a) As there is no mention of "composition of air and the presence of Carbondioxide and water-vapour in air" in the syllabus for any of the classes VI, VII and VIII (i.e. the

middle school stage) this should be included under this major concept. Furthermore to acquaint the pupils with the function of Carbondioxide in the process of photosynthesis (subconcept) it is necessary that pupils first learn that this gas is present in the air.

A1(b) This refers to the action of Oxygen and water vapour in rusting and may be studied immediately after the study of composition of air A1 (a) for better integration. We would suggest to include the process of combustion which is so common a phenomenon but not included in the syllabus of the middle-school-stage.

A.2(a) "Water is vital for life"—sources of water, the impurities present in water obtained from different natural sources should be included in the sub-concepts. "The chemical processes—sedimentation, decantation and filtration (included in the syllabus of class VII) may be dealt with in class VI in connection with the purification of water under this unit.

2 (b) "Water is a good solvent" and "Hard and soft water"-may be dealt with in class VII under the the unit "solute and solvent". The process of distillation may be included under this unit as the method of removing soluble salts from water.

2 (c) "Water may become impure in many ways". The process of sterilisation may be included here as the method of making water free from disease germs.

CLASS—VII

A.1. "Air occupies space" should be included under this unit.

We suggest that "Air"—major concept 1 be split up into two as follows :—

1 (a) "Air occupies space and possesses weight".

1 (b) "Air developes force"—The syllabus in class VI is comparatively heavy compared to that in class VII. The major concept 1 (b) "Hot air is ....air" may be dealt with under this concept in class VII.

1 (c) The process of ventilation and its importance in life. (This may be included here.)

It is not understood why such an important topic has been omitted throughout the middle school stage.

B.2. (b) "Chemical proccss......etc". It will be more appropriate to deal with these processes in connection with purification of water under 2 (a)—suggested by us for class VI. The major concept 2 (b) along with subconcept (ii) under 2 (a) in class VI may be introduced as 2 (a) in class VII.

The major unit 2 (a) "solute and solvent" should be dealt with after 2 (a) as 2 (b).

C.1. The sub-concepts under major concept "soil" (1) should include (i) a qualitative treatment of composition of soil (moisture content, organic matter and inorganic or mineral matter), (ii) physical properties of soil and bearing on plant growth.

D. It is not understood why the structure of stem and its function are omitted. We

suggest in class VII structure and functions of stem and root be dealt with along with their modification.

D.3. ' Structure of leaves......" may be dealt with in class VIII in connection with "plants make their own food."

4. The sub-concepts are not mentioned. We suggest the following sub-concepts.

(i) Study of the external features of toad and frog.

(ii) Functions of (a) mouth (b) limbs (including locomotion), (c) vocal sac, (d) eyes, (e) ear, and (f) warts and parotid gland (in toad) , (g) nostrils, (h) skin.

(iii) Distinction between the external feature of toad and frog.

CLASS—VIII

A and B. For better integration the two units A and B (Atmospheric pressure and pressure of water) may be combined into a singe major unit "Concept of pressure with reference to pressure of air and water" and the following sub-units will cover the ground under A and B in the syllabus for class VIII.

(a) Pressure of air and water as thrust on unit area.

(b) Characteristics of pressure exerted by air and water including their differences.

(c) Measurement of atmospheric pressure—Barometer and its use in weather forecasting.

(d) Application of air pressure—siphon, syringe, common suction pump, compression pump.

(e) Application of water pressure—dam, generation of electricity, town water supply, and Artesian well.

[The above treatment will also help in reducing the load.]

C. We suggest to include "the concept of energy" at this stage with the following subconcepts.

(i) Energy defined.

(ii) Forms of energy with simple illustrations.

(iii) Electrical energy—simple voltaic cell.

(iv) Magnetism—properties, making artificial magnets, uses of magnet.

D. "Matter and materials".

This should also include—the definition and concept of matter, classification of matter, physical and chemical properties of matter, chemical reaction.

1. Functions of roots and stems need not be repeated as we suggested a detailed study of these in class VII.

Structure of leaves may be dealt with in Class VIII in connection with photosynthesis, transpiration and respiration. Structure and function of leaves should be included here in class VIII.

E. 3. Locomotion of frog may be omitted as this will be dealt with in class VII as suggested by us.

Instructional Materials in General Science Class VIII

PART—I

1. Need of teaching General Science at the Middle School stage.
2. Aims and objectives of teaching General Science
3. Approach to teaching General Science.
4. Evaluation
5. How to use Teaching Units.

The need of teaching General Science at the Middle School stage

When a child comes to the middle school the stage of romance is over and he wants precise information about the things of the material world around him. He has by this time discovered the wide world and is eager to go about exploring it. He is a hesitant 'rebel' eager to challenge authority, yet not quite ready to form independent judgment. He is argumentative and this tendency can be profitably channelised in the study of science. Science discourages opinions and heresay evidence and believes in experimental evidences. The realisation of concrete facts can be taught and encouraged at this stage through the teaching of science. The child is vitally interested in the elements of his environment that constantly stimulate his curiosity and challenges his interest. He is fond of things, "thing to talk about and things to find out." A course of general science will provide a suitable medium for harnessing these natural tendencies in children at the middle school stage.

Education is intended to make us fit for graceful and purposeful living and help us in successful life adjustment. The present age is the age of science. The intellectual climate of the present day is permeated with the ideas and hopes of scientists Science unfolds a picture of the physical world and enables the child to extend his knowledge and to exercise some control over his environment. Education of children must therefore take into account the intellectual climate of the present day. Almost every activity in the modern world rests on ideas and devices that emerge as a consequence of scientific development. The method of science also provides a powerful tool for unravelling secrets and solving problems. This significance of science as a part of our material environment, as a part of our intellectual environment and as method of solving problems are the reasons why science has an essential place in general education.

We are contemplating to make education free and compulsory upto the age of fourteen which covers the entire middle school stage. Education upto this stage should, therefore, be self-sufficient and provide a training in citizenship. In a developing country like ours the education upto the middle school stage should therefore provide for the initial training of building up a community of scientific workers and promoting the understanding and social

appreciation of science among the general public. Scientists and technicians do better work when their efforts do not meet blind opposition and when the spirit of the time is in sympathy with them. The economic and social progress of the country will largely depend on the appreciation of the efforts of the scientists and technicians and on a constant supply of skilled workers upon whose nimble fingers depends the industrialisation of our country. A course of general science will help in making pupils aware of the methods and attitudes of scientists, in developing the ability to come to decision in an increasingly rational manner and in accordance with the principle of scientific validity. This is the only way to replace superstitions and outdated dogma and to bring a change in society to make conditions suitable for rapid economical and national development by removing all barriers to the effective utilisation of all productive forces and all available resources for the benefit of the people of the country.

Objectives of teaching general science :—

1. To enable the students to acquire knowledge of scientific facts and principles which are essential for an intelligent understanding of the material world.
2. To enable the students for successful adjustment to the immediate environment.
3. To enable the students to apply their acquired knowledge in
   - (i) identifying scientific principles in a situation,
   - (ii) giving scientific reasons,
   - (iii) predicting results,
   - (iv) drawing inferences,
   - (v) selecting means to a given purpose,
   - (vi) checking adequacy and superfluity of data,
   - (vii) arriving at a decision in a rational manner,
   - (viii) shifting facts from propaganda.
4. To enable the student to acquire skills in
   - (i) handling and manipulating scientific equipments and apparatus,
   - (ii) reading scientific instruments,
   - (iii) drawing graphs, sketches in respect of scientific materials,
   - (iv) constructing simple gadgets and appliances.
5. To develop an appreciation of science and its methods.
6. To develop understanding of how science has benefitted mankind.
7. To discover scientific talents in schools and to foster their development.
8. To create an active interest in scientific development.
9. To develop an understanding of the limitations of science.

Approach to teaching general science

If we focus our attention on certain trends in most normal children from 3 to 5 years onwards we get sufficient evidences of the children's natural curiosity and interest in finding out about things partly by asking questions as what are these ? where do they come from ?

what are they made of and how do they work? and partly also, if given a chance, by exploring and finding out for themselves. Their particular interest in grounds and reasons and above all explanations is expressed in their persistent "why" questions.

Any worthy approach of teaching science must be capitalised on these natural tendencies of children. Every question raised in the mind of the child is a problem for him—a problem worth solving, whether the solution is reached with the help of the teacher or a text-book or by exploring the field of related activities. The keynote of our approach should be to place the subject-matter in the form of a problem which will initiate children into activities.

Science is investigation and pupils should be given enough opportunities to develop the power of investigation, as the natural way of learning is by doing things for themselves. This involves sufficient pupil activity for gaining direct purposeful experiences as far as practicable.

We cannot expect to develop manipulative and constructive skills unless the child is given the opportunity of handling apparatus and of constructing simple devices. We cannot expect our children to develop the power of observation and reasoning unless they are given the scope to observe and to reason from observed facts.

For the realisation of the objectives of teaching General Science the selection of the proper methods of teaching should be made in the light of above considerations.

Evaluation :

When objectives of teaching general science are formulated, learning units are organised and the best methods are employed, there should be some yardstick to assess to what extent the objectives sought have been actually achieved. In other words there must be some scheme to evaluate the outcome of learning by the help of suitably constructed tests. Such evaluation would not only help a teacher to assess the pupil achievement but the results of such tests would provide an opportunity for a teacher to evaluate his work in the light of the objectives at every stage and modify his methods, if necessary, for better results.

Details about the scheme of evaluation is beyond the scope of the workshop and only an outline of the scheme is mentioned here.

1. Interim tests—objective/semiobjective or a combination of both may be given during the teaching of any particular unit.

2. Records of assessment of practical work, home work, and subjective qualities (like sense of responsibility, degree of interest shown in activities) may be kept at regular intervals during the teaching of any particular unit.

3. At the end of each unit tests based on short answer type may be given and assessment made.

4. At the end of each term a well-designed examination paper containing both short answer and long-answer questions may be given. Statements of facts and exercises in reasoning and thinking may be dealt with in short-answer questions including diagrammatic

tests. Long-answer type will provide the pupils to demonstrate, and the teacher to evaluate other abilities.

5. At the end of each term practical tests may be given and a final assessment be made on the basis of the results of this test and record of pupils' day to day work.

6. At the end of each term teacher's observation and assessment of other subjective qualities may be compiled and recorded.

How to use the Teaching Unit :

The teaching unit is designed to give an indication as to the possible methods of developing the units in the class room. A teacher can think of it and plan his work following various approaches. The teaching unit, given in the succeeding pages is not intended for teachers to imitate but is intended to suggest points for the techniques to be adopted.

The general procedure followed is based on recalling previous experiences, performing simple experiments, collecting data, coming to a logical conclusion, generalising, and understanding concepts. The advantage of this method may be appreciated and the teacher may plan in his own way. As the facilities available, the resources of the school, the circumstances in which the work is to be carried out will vary from school to school the teacher will have to develop these units using relevant teaching situations.

Suggested activities are outlined. This is only to give an indication as to the nature of the work to be done by the pupils. The background material given in some cases is ready-made reference material for the teacher. Quite a good number of experiments and activities are given and the emphasis is on the development of understanding of concepts, developing skills, abilities and attitudes. It is for the teacher to decide whether he should utilise all, some of them, modify some of the experiments to suit the conditions in his school or to change according to his own plan.

PART II

TEACHING UNIT

Matter and Materials

Class—VIII

CONTENT

Sub Unit — 1 : Matter and its classification.

Sub-Unit — 2 : Properties of matter and the changes undergone by matter.

Sub-Unit — 3 : Simple and complex substances.

Sub-Unit — 4 : Constitution of matter.

SUB-UNIT 1

MATTER AND ITS CLASSIFICATION

a) **Objectives, Knowledge and understanding :**

i) To help pupils in understanding the concept of matter.

ii) To acquaint pupils with the major groups under which matter and materials can be classified.

b) **Abilities :**

i) To study the characteristics of matter.

ii) To generalise the characteristics of matter.

iii) To compare matter and energy.

iv) To classify different kinds of matter according to their structure and composition.

v) To express scientific facts precisely and correctly.

c) **Appreciation :**

i) To develop an appreciation of the necessity of classifying materials into groups.

d) **Attitude :**

i) To come to a conclusion based on observed facts.

CONTENT

Major Concept

There are different kinds of matter in the universe. They can be classified into groups according to their structure and composition.

Sub-Concepts

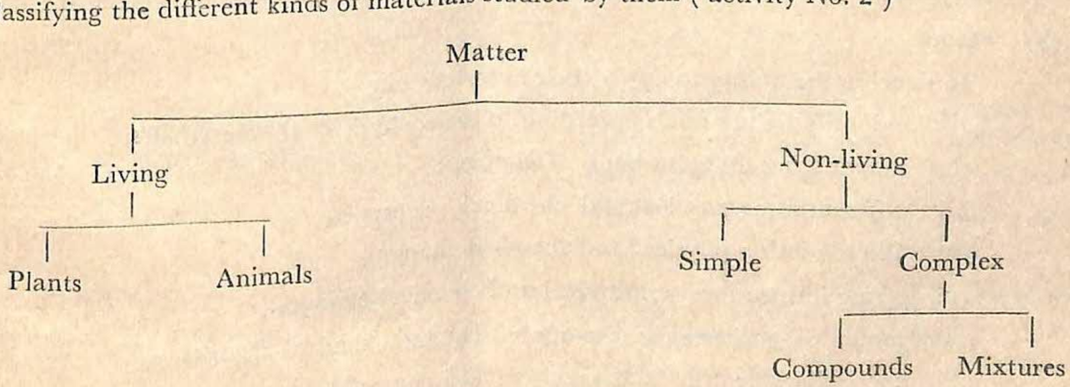
(a) Anything that occupies space and possesses weight is called matter.

(b) Matter can be percieved by our senses, and it cannot change its position unless acted on by some external force.

(c) Matter can be classified into living & nonliving. Living things can be classified into plants & animals. Nonliving things are classified into simple and complex substances. Complex substances are further classified into compounds and mixtures.

Suggested activities :

1. Recalling previous experiences on study of the physical characteristics of matter (class VI) providing sense training, on air has weight and it occupies space (class VII) and on concept of energy in the previous unit in class VIII.
2. Studying the common characteristics of air, water, soil, iron, copper, sulphur, sugar, salt, coppersulphate, gunpowder, muddy water, concrete and such other materials with which they are familiar.
3. Studying the property of inertia of matter with things mentioned in 2.
4. Making a list of different forms of energy (studied in the previous unit in class VIII.)
5. Finding out the similarities and dissimilarities of matter and energy.
6. Generalizing the definition of matter.
7. Discussing the importance of classifying matter (to be held by the teacher) into different groups.
8. Classifying the different kinds of materials studied by them (activity No. 2)



Although the study of living things is not included in the present unit, this has been mentioned here to make the classification of matter complete.

Supplementary matter for the teacher :

There are so many hundreds of thousands of different materials, or substances in the world, that it is useless to try and study them without some system for sorting out the different kinds of matter and classifying similar substances together in groups ; just as the books in a library must be classified if you are to find the books wanted without waste of time. In a library, it is possible to classify the books in various ways. For example, we could put on the same shelf all the books of the same size, or all the books with covers of same colour but although these arrangements might be very nice to look at, they would be useless to anyone who would like to use the library. In practice, it is much more convenient to group the books according to their contents, putting all the books of adventure, all the books of travel, all the historical books and all the scientific books on separate shelves. Then we know just where to look for any particular kind of book.

When we group together things that are alike, we can talk about them more easily if we have a name for each group of things.

To classify everything in the world into convenient groups is much more difficult than classifying the books in a library. In fact, it took the early men of science over a thousand years to work out a suitable system for classification of matter. Many different systems were tried, but it was not until about the end of the eighteenth century that a simple and satisfactory chemical classification was made.

SUB-UNIT-2

PROPERTIES OF MATTER AND CHANGES UNDERGONE BY MATTER

Objectives :

(a) Knowledge and understanding :

(i) To develop an understanding of the physical and chemical properties of matter.

(ii) To develop an understanding of the types of changes undergone by matter.

(iii) To acquaint the pupils with the characteristics of physical and chemical changes.

(b) Abilities :

To develop the ability to apply their knowledge in

(i) indentifying materials according to their physical characteristics,

(ii) indentifying different kinds of changes,

(iii) differentiating physical and chemical properties,

(iv) differentiating physical and chemical changes,

(v) giving illustrations of physical and chemical changes,

(vi) generalising characteristics of physical and chemical changes,

(vii) expressing scientific facts precisely and correctly.

(c) Skill :

(i) To develop manipulative skill in handling simple laboratory apparatus.

(d) Attitudes :

(i) To develop the attitude of judging things objectively.

(ii) To develop the attitude of coming to decision with scientific validity (based on observed facts).

CONTENT

Major Concepts	Subconcepts
1. Different kinds of matter have different properties which help us in indentifying them.	a) Matter can exist in three different states solid, liquid and gas. The state in which a particular kind of matter exists is one of its physical properties.
	b) Other physical properties of matter are— its colour, texture, odour, density, melting point, boiling point, whether it is attracted by a magnet.
	c) Properties which can be studied without bringing any change in the original substance are called its physical properties.
	d) The common chemical properties are whether it burns itself in air or it supports burning, its action on litmus, how it reacts with other substances.
	e) Properties which can be studied only by bringing about a change in the original substance are called chemical properties.
2. Matter undergoes two types of changes—physical and chemical	a) Physical changes are those changes in which no new substance or substances with properties other than those of the original substance or substances are formed.
	b) During a physical change the constitution of the original substance or substances is not changed

c) Physical changes are temporary changes and the original substance or substances can be obtained by simple physical means.

d) In a physical change there may or may not be any change of temperature.

e) Chemical changes are those changes in which new substances with entirely different properties are formed.

f) During a chemical change the constitution of the original substance or substances is changed.

g) Chemical changes are permanent and it is not possible to get back the original substance by physical means.

h) During a chemical change there is always a change in temperature.

i) The process by which a chemical change is brought about is called a chemical reaction.

Suggested activities :

For major concept—1

1) Recalling previous experiences in regard to three states of matter.

2) Performing the following experiments, noting down their observations.

(a) $\text{Ice} \underset{\text{cooled}}{\overset{\text{heated}}{\rightleftharpoons}} \text{Water} \underset{\text{cooled}}{\overset{\text{heated}}{\rightleftharpoons}} \text{Water vapour}$

(b) $\text{Wax} \underset{\text{cooled}}{\overset{\text{heated}}{\rightleftharpoons}} \text{Liquid Wax}$

(c) $\text{Sulphur} \xrightarrow{\text{heated}} \text{Liquid sulphur} \xrightarrow{\text{heated}} \text{Sulphur vapour}$

(Sulphur vapour $\xrightarrow{\text{Cooled}}$ Sulphur)

3) Deducing the conclusions that solid, liquid and gas are the three states of matter and by reversing the conditions the state of existence can be reversed. Ice, water and water-vapour are virtually the same substances. The three states in which matter can exist are its physical properties.

4) Studying the colour, texture, odour, taste, solubility, density, melting point and boiling point of selected substances like—Sugar, Salt, Chalk, Flour, Blue vitriol, Sulphur, Iodine, Napthalene, Camphor, Rock, Iron, Nickel, Copper, Wax, Water and so on.

5) Study the magnetic properties of Iron and Nickel (others are not magnetic substances).

6) Noting down that all these properties can be studied without bringing about any change in the original substances. These are physical properties of matter.

7) Find experimentally that (a) Sulphur, Methylated spirit, Petrol, Wood, Coal, Coal gas, and Hydrogen are inflammable. (b) Iron, Nickel, Rock are not inflammable. (c) Air, Oxygen, Potassium chlorate, Nitric acid help in burning.

8) Studying from the above experiments (in 7) that for studying these properties the original substences have to be completely changed. Such properties are called chemical properties of matter.

For major concept—2

1) Performing the following experiments, noting down their observations and generalising the characteristics of physical changes (mentioned in subconcepts).

(a) Weighing a coil of nichrome wire, heating it to redness, cooling and weighing it again. Comparing its appearance with a nichrome wire that has not been heated. Comparing the weights before and after heating.

b) Weighing a basin with a piece of wax, heating the basin on a water bath till the wax melts, cooling the wax and weighing the basin with wax. Camparing the appearance with that of another piece of wax and the weights before and after heating.

c) Weighing a piece of soft iron, bringing it near a bar magnet and studying the magnetism induced in the soft iron bar. Weighing the soft iron bar and camparing the weights before and after magnetising it. Studying that the soft iron bar behaves as a magnet so long it is kept very close to the bar magnet and it cannot behave as a magnet if the bar magnet is taken away.

2) Performing the following experiments, noting down their observations and generalising the characteristics of chemical changes. (Ref. subconcepts)

a) Weighing a crucible with a piece of magnesium (kept in the form of a coil), heating it strongly until it is converted into magnesium oxide, cooling and weighing again. (The appearance of the new substance formed is to be compared with that of a piece of magnesium, studying that magnesium cannot change the colour of litmus but the new substance when dissolved in water can change the colour of red litmus into blue). The weights before and after heating are to be compared.

b) Weighing a basin with a piece of calcium oxide, adding water to calcium oxide till it crumbles. Weighing the basin with the new substance formed, noting the evolution of heat, comparing the weights before and after adding water to quicklime.

c) Heating sugar strongly in a test-tube, holding a lighted taper near the mouth of the test-tube when dense fumes issue from its mouth. Noting the burning of the issuing gases and comparing the appearance and taste of the charcoal left in the test-tube with that of original sugar.

(3) Generalising the characteristics of chemical changes from the observations of experiments (a), (b) and (c) and the definition of a chemical reaction.

Assignments :

1. Making a record of five physical and five chemical changes other than those studied above.
2. Preparing a chart showing the distinctions between physical and chemical changes.
3. Weighing a piece of muslin in which some iron filings are wrapped. Moistening the iron filings and muslin, leaving it in air for a few days, weighing it again and comparing the appearance and weights before and after rusting.

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SUB-UNIT—3

SIMPLE AND COMPLEX SUBSTANCES

Objectives :

a) **Knowledge and understanding** :

i) To acquaint the pupils with elements, mixtures and compounds.

ii) To develop an understanding of the distribution of elements in the earth's crust and of the two main classes of elements—metals and non-metals.

iii) To acquaint the pupils with the differences between elements, mixtures and compounds.

b) **Abilities :**

i) To develop the power of keen observation.

ii) To develop the ability to derive conclusions from observed facts.

iii) To develop the ability of inferential reasoning.

iv) To develop the power of applying acquired knowledge in interpreting data, in giving scientific explanation and in identifying elements, mixtures and compounds.

c) **Skills :**

i) In manipulating simple laboratory apparatus.

ii) In presenting and recording scientific data in an organised fashion.

d) **Attitudes :**

i) Willingness to subject his conclusions to experimental verification.

CONTENT

Major Concept	Sub-concepts
1. Simple substances are called elements which can be classified into two main groups—metals and non-metals.	a) Substances which cannot be split up or decomposed into two or more simpler substances by any chemical means are called elements.
	b) There are 92 elements found in nature and 12 new elements have been prepared by modern scientists.
	c) Elements fall into two main groups—metals and non-metals.
	d) Metals and non-metals differ in their properties like lustre, malleability, ductility, toughness, conductivity, density and the like and also in their chemical properties.
2. Substances which do not belong to the class of elements are called complex substances— compounds and mixtures.	a) When two or more substances (elements or compounds) are merely blended together so that each substance can be identified by their respective properties a mixture is said to be formed.
	b) When two or more elements are made to combine together by chemical reaction a compound is said to be formed.
3. Mixtures and compounds differ in many respects.	a) The constituents of a mixture may be present in any proportions.
	b) In a mixture each constituent keeps its own original properties unchanged.
	(c) The constituents of a mixture lie side by side as separate particles and there is no chemical attraction binding them together.
	d) The constituents of a mixture can be separated by easy physical means.
	e) When a mixture is made there is little or no change in temperature.
	f) The constituents of a compound are always present in fixed or definite proportions

g) The properties of a compound are quite different from those of its constituents.

h) Compounds are the products of chemical changes and their constituents are held together by a chemical force.

i) The constituents of a compound cannot be separated by physical means but only by employing chemical changes.

j) When a compound is made there is a change in temperature (heat is given out or taken in).

Suggested activities :

For major concept—1

1) Recalling past experiences on classification of matter (Sub-unit-1)

2) Heating a little mercuric oxide (a spatula measure) gently in a test-tube (100mm x 10mm) using a low non-luminous flame (only the lowest part of the test tube should be heated), collecting the issuing gas and testing for Oxygen. The ring of droplets of condensed mercury above the heated portion may be observed and identified.

(Mercuric oxide **heated**—Mercury + Oxygen). Heating the mercury thus obtained in absense of air without any further change.

3) Heating a little sawdust in a test-tube and identifying the carbon thus formed. On further heating the carbon in absense of air it can be shown that it does not split up into simpler substances.

4) Burning a piece of magnesium in a jar of carbon-dioxide and identifying the black substance formed as carbon.

5) Electrolysing copper sulphate solution and obtaining copper. On passing electric current through copper it cannot be decomposed into any simpler substance.

6) Electrolysing water and decomposing it into hydrogen and oxygen.

From a study of above mentioned thermal and electrolytic decomposition the concept of an element is likely to emerge.

7) Having a good look at the specimens of some elements (Copper, Aluminium, Iron, Lead, Carbon, Iodine, Sulphur, Silicon, Hydrogen, Oxygen may be used) and studying the following properties.

(a) State of existence at ordinary temperature, (b) density, (c) lustre, (d) metallic clink, (e) whether the element is brittle, (f) power of conducting heat and (g) power of conducting electricity.

8) Classifying the above elements into groups—metals and non-metals.

(To make the idea of the differences between metals and non-metals complete, the teacher can demonstrate other properties and hold a discussion.)

For major concepts—2 and 3

1) Mixing of nitrogen with oxygen and studying that it is a mixture as the properties of oxygen remain unchanged.

2) Mixing carbon with oxygen—both can be identified.

3) Burning carbon in oxygen—the substance formed is altogether different—properties are totally changed and none of them can be identified. Burning magnesium in a jar and separting carbon showing that the element carbon and oxygen are still present in carbon dioxide. (Recall the experience of burning magnesium in oxygen forming a white powder like the one formed here).

4) Heating mercury in presence of oxygen to form mercuric oxide—a substance with properties quite different from those of mercury and oxygen. Decomposing mercuric oxide thus formed into mercury and oxygen showing that both the elements are present in mercuric oxide although they cannot be identified by their physical properties.

5) Studying the properties of iron and sulphur (colour of them, reaction of iron with dil. hydrochloric acid, solubility of sulphur in carbon disulphide, magnetic properties of iron).

6) Mixing iron and sulphur in any proportion—studying their individual properties while mixed.

7) Heating measured amount of iron filings and sulphur on a piece of asbestos paper. Noting the evolution of heat and that the reaction once started continues unaided.

8) Studying the properties of the newly formed substance (a) treating it with carbon disulphide, with dilute hydrochloric acid (b) with a magnet, and (c) under a magnifying glass.

[Some samples of iron filings may be found not to react with sulphur under the conditions of the experiment described in (7) above. The teacher should therefore try out his supply in advance. Iron metal powder reduced by hydrogen (prepared by British Drug House Ltd.) is satisfactory.]

From the results and observations of the above experiments the pupils will develop the concept of mixtures and compounds (major concept-2) and of the distinctions between mixtures and compounds (major concept-3)

Background knowledge for the teacher :

The idea that all substances are built up from a number of elements is an old one. Such speculations as to the structure of matter were traceable in the writings of the ancient Indians. In ancient India there sprang up a system of philosophy which assumed the

existence of five elements, viz. khiti (earth) apas (water), tejas (fire), marut (air), byoma (ether space).

Aristotle's (384 -322 B.C.) theory of 4 elements viz. fire, air, earth and water which represented but four fundamental qualities only was one of the earliest attempts to explain the nature of matter. According to this theory these four elements mixed in different proportions could account for the existence of all the different kinds of substances. This idea of elements governed the thinking of scientists for nearly two thousand years. About 400 years ago scientists in Western Europe began to question many of the ideas of the Greeks. They tested them by experiments and found that many of them did not fit the facts. The spirit of questioning spread to England and in 1661 Robert Boyle in "The Sceptical Shymist" gave the first, more or less, up-to-date definition of elements. He defined an element as a pure substance that cannot be broken down into, or produced from, simple pure substances.

The elements that are known today are present in the Earth's crust. The proportion by weight of the elements that make up the Earth's crust is roughly as follows :—

Silicon	—	26%	Potassium	—	2½%
Aluminium	—	7%	Magnesium	—	2%
Iron	—	4%	Hydrogen	—	1%
Calcium	—	3%	Remaining	—	
Sodium	—	2½%	Oxygen	—	50%
			83 elements	—	2%

From the chart it is seen that two of the elements oxygen and silicon together make up more than three quarters of the weight of the Earth's crust. But these elements are not easily found as most of them are usually present in chemical combination with other elements.

Following upon Boyle's definition of an element, chemists realised that they must search for these simple substances by breaking down more complex substances. Any substance they could lay their hands on, they took to pieces and carefully examined the bits. In 1789 the great French chemist Lavoisier drew up a table of the elements. Thereafter, more and more new elements were discovered. It was an exciting time for the chemists. They received specimens of mineral ore from all over the world. They treated these with chemicals to see what happened. If the ore behaved in a strange fashion, a new element might well be hidden in it. The colour or weight of the sample, if unusual, might also give the chemist a clue. If the chemist suspected that something new was there, he would try to isolate a compound of it. He would do this by treating the mineral with another chemical, or heating it, or both. When he had managed to make the compound, he then used it to prepare some of the pure element. The final substance was accepted as an element when it was proved that no one could break it down any further.

After the discovery of radioactivity towards the end of the last century scientists realised that some elements break down to form simpler ones. This happens naturally. The next step was for scientists to make the change happen themselves. The first person to

do so was Lord Rutherford. In 1919 at the famous Cavendish Laboratory he bombarded the gas nitrogen with atomic particles from a radioactive element and so converted a few atoms of it into a few atoms of oxygen. After Rutherford numerous other people carried out similar transmutations.

At first the transmutations that scientists brought about were always from one known element into another. But starting in 1940, American chemists working at Berkeley, in California, have been making a series of new elements. Most of these elements, which are built up by bombarding the heaviest known natural element uranium, can be made only in minute quantities. All of them are radioactive and in time break down to form simpler known elements. For this reason, they may once have existed on Earth but, so far as known, do so no longer. So far, eleven new elements have been made, which means we now know of 103 elements altogether.

SUB-UNIT 4

CONSTITUTION OF MATTER

Objectives :

A. **Knowledge and understanding :**

i) To develop an understanding of the constitution of matter.
ii) To develop the concept of atoms and molecules.
iii) To acquaint pupils with fundamental properties of atoms and molecules.

B. **Abilities :**

To apply the acquired knowledge in

i) differentiating an atom from a molecule.
ii) educing relationship between atoms and molecules.
iii) differentiating elements and compounds in the light of combination of atoms to form molecules.
iv) identifying the part played by atoms in chemical reactions.

C. **Skills :**

To develop skill in

i) constructing models of atoms and molecules using clay, plasticine, wax balls or beads.
ii) drawing diagrams and making charts to illustrate the constitution of matter.

D. **Appreciation :**

i) appreciation of the contribution of Dalton and Avogadro.

CONTENT

Major Concept	Sub-concepts
1. The smallest particle of a substance (element or compound) which can exist in the free state is called a molecule.	a) Molecules are the ultimate particles of a compound. b) Molecules are the ultimate particles of an element that are capable of separate existence. c) Molecules may contain more than one atom. d) Molecules break up into still smaller particles called atoms during a chemical change. e) During a chemical change atoms of one element combine with atoms of another element to form new or different molecules. f) Molecules of simple substances or elements consist of atoms which are all similar. g) Molecules of compounds consist of atoms not all of which are similar.
2. Atoms are the ultimate particles of an element which take part in a chemical change.	a) Atoms of the same element are similar to one another in respect of their weights and properties. b) Atoms are units that take part in a chemical reaction. c) Atoms of different elements are dissimilar in respect of their weights and properties. d) Usually atoms of non-metals (with the exception of rare gases, carbon and silicon) are not capable of separate existence. Two or more atoms of such elements combine to form molecules.

Suggested activities :

1. Taking a crystal of Sodium Chloride—breaking it down into smaller and smaller pieces. (The teacher holds a discussion and develops the idea that by breaking down the crystal of Sodium Chloride into smaller and still smaller particles a stage will be reached when it will not be possible to break it any further so that the smallest or ultimate particle thus obtained still retains the property of Sodium Chloride. This smallest particle of the compound Sodium Chloride is called a molecule).

2. The teacher gives similar illustration in case of mercuric oxide.

3. Taking water in a flask and dropping a crystal of ammonium dichormate it can be shown that within ten to fifteen minutes the colour will spread throughout the water (Particles of ammonium dichormate cannot be identified but the presence of colour indicate that the substance has spread throughout the liquid and the particles that give the colour are the smallest particles of the compound ammonium dichromate and are called molecules).

4. Taking sulphur and breaking it into smaller and smaller pieces. (The teacher holds discussion and develops the idea that by breaking the piece of sulphur into smaller and still smaller particles a stage will be reached when it will not be possible to break it any further so that the ultimate particles thus obtained still retains the properties of sulphur. This ultimate particle of the element sulphur is called an atom)

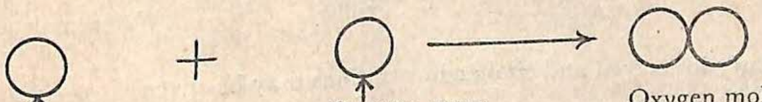
   Similar illustration may be given in case of other elements like carbon, iron. etc.

5. Recalling the experiences on decomposition of mercuric oxide. Holding a discussion that since mercuric oxide is a pure substance it is composed of only one kind of molecule that of mercuric oxide. Neither the element mercury nor the element oxygen is present as such in mercuric oxide. Hence it follows that mercury and oxygen must have been formed as a result of the decomposition of molecules of mercuric oxide.



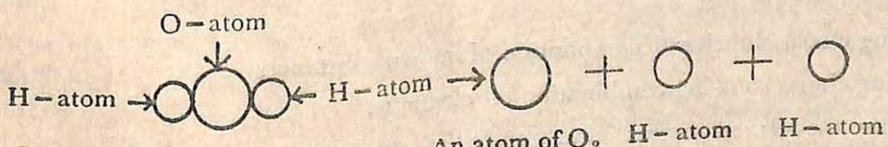
Molecule of HgO — Mercury atom — Oxygen atom

In the process of decomposition each molecule of mercuric oxide decomposed into one atom of mercury and one atom of oxygen. In the process innumerable atoms of mercury and oxygen are formed. But if we collect the gas oxygen (a non-metal) it is found that two atoms of it are combined to form a molecule. This is because an atom of oxygen cannot exist by itself and can exist only in the molecular state.

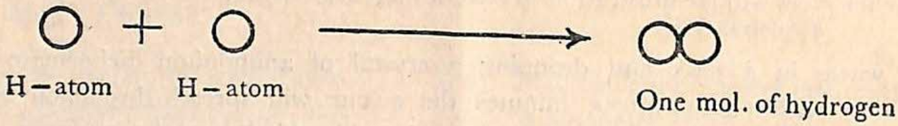


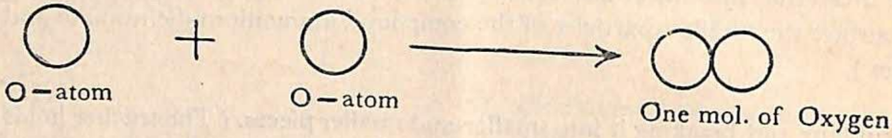
Oxygen atom — Oxygen atom — Oxygen molecule

6. Recalling the experience on decomposition of Water similar illustrations can be given.



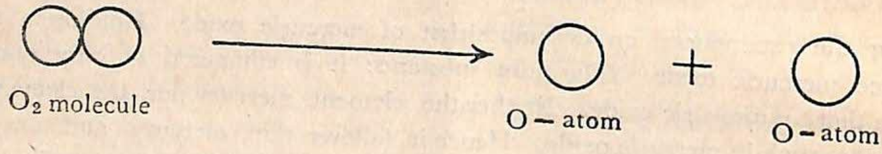
One mol. of water

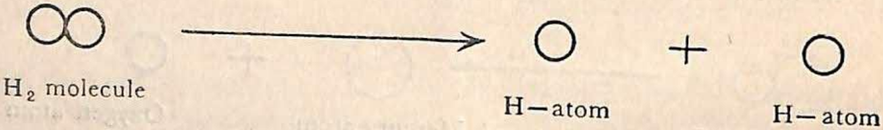




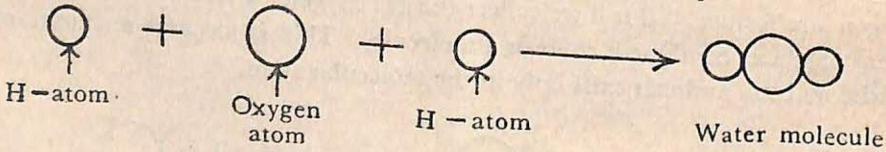
7. Burning hydrogen and oxygen to form water. Students are already acquainted that hydrogen and oxygen can exist in molecular state and that one molecule of hydrogen contains two atoms and so is the case with oxygen.

   In the process by which water is formed the chemical change takes place in the following way.





   All oxygen molecules break up into atoms of oxygen and all hydrogen molecules break up into hydrogen atoms. There will be innumerable number of oxygen and hydrogen atoms. The combination between oxygen and hydrogen takes place in the following way.



8. Heating mercury in oxygen and similar illustrations may be given.
9. Different elements have their characteristic properties. Atoms of different elements are the ultimate particles of elements. They must therefore have different properties. Atoms of the same element have similar properties.

Assignments for the pupils :

1. Preparing charts showing decomposition of known substances.
2. Preparing charts showing combination of elements.
3. Preparing models of atoms and molecules of elements and compounds using clay, plasticine, wax balls or beads.

DEPARTMENT OF EXTENSION SERVICES
INSTITUTE OF EDUCATION FOR WOMEN
REPORT OF THE MATHEMATICS GROUP

(Summer Vacation Workshop – 9th June – 18th June '69)

The Seminar on "Teaching-Learning Units in History, Mathematics and Science" started at 11 A. M. on 9th June, 1969. Nineteen teachers came from different schools of West Bengal. The other persons present were Sm. Aparajita Ray, Co-ordinator, Sri K. K. Chatterjee, Evaluation Officer, Sri M. K. Ray, Sri S. N. Giri, Sri P. Ghosh and Sri G. Mitra. Sm. Ray introduced the resource persons to the participants.

In the morning session, the resource persons discussed on the present educational curriculum and its defects. In the afternoon session, participants were divided into three groups. The three groups discussed separately on the curricula of History, Mathematics and Science.

On the second day Sri K. K Chatterjee delivered a lecture on "the significance of teaching-learning unit". He pointed out that there are some broad objectives of education. Framing the syllabus, writing of text-books and methodology of teaching should be objective based. Preparation of teaching-learning unit aims at writing content materials in order to achieve desired objectives In the afternoon, Sri P. Ghosh, Sri S. N. Giri and the Mathematics group discussed on the general objectives of teaching mathematics.

On the third day, the resource persons discussed on the defects of the existing curriculum. The participants took part in the discussion and pointed out some difficulties in their class-room experiences. In the afternoon, the three groups discussed separately and gave a few suggestions for the improvement of present syllabus. In the subsequent days, the three groups met separately and prepared "teaching-learning units," on three topics, one each in History, Mathematics and Science. The Mathematics group selected "Equation" as their topic and prepared a "teaching-learning unit" on it.

The report containing the suggestions for the improvement of the syllabus was presented before Sri N. K. Sinha, Secretary, West Bengal Board of Secondary Education, on the 10th June, 1969, who gave an appreciation for the reports.

Three groups also presented the teaching-learning units before Sri D. Mohanto, Principal, Bureau of Educational and Psychological Research, at the end of the session.

Name of Participants in the Mathematics Group

Name	School
1. Jharna Mazumder	Khantura Girls' H. S. School.
2. Jana Dey	Chandravag Srikrishna Girls' H. S. School.
3. Tripti Sen	Do
4. Ranu Banerje	Jagatpur Rukmini Vidyamandir for Girls.
5. Swapna Ghosh	Bisnupur Grihasree Siksayatan.

DEPARTMENT OF EXTENSION SERVICE
INSTITUTE OF EDUCATION FOR WOMEN, HASTINGS HOUSE, ALIPORE, CALCUTTA

Summer Vacation Workshop, 9th June—18th June, 1969

A few suggestions for the improvement of syllabus in Mathematics for Class VIII

1. The present syllabus does not specifically mention any objectives for the teaching of mathematics. It is better if a few objectives are stated in the syllabus. This will act as a guideline to the teachers in their teaching.

2. The present syllabus does not clearly define the scope of the topic. The sequential concepts and subconcepts of a topic are left to textbook writers. For example, Unitary method, Percentage, L. C. M. and G. C. M., Fractions and Decimals occur in a number of classes. But the scope of a particular topic in a particular class has not been mentioned. It becomes diffficult for a teacher to know what amount of the topic is to be imparted to the students.

3. The syllabus has laid emphasis on revision. The statement, 'Revision of Previous Work' seems to be a bit ambiguous to the teachers. It is necessary to mention the particular topic or topics which are to be revised for learning new ones.

4 Teaching and learning activities should be given in more details. Practical activities for mathematical problems, specific items of demonstration in class-room, experiments etc. should be suggested in the syllabus. This may bring work-experience in the class-room.

5. The methods of examining theoretical and practical mathematics should be mentioned. Specific instructions for the framing of question papers should be given in the syllabus.

6. It has been observed in most textbooks of Arithmetic and Algebra that a good number of rigorous problems are given at the end of the exercise. It has been observed that most of the students in the class are not interested to slove them and fear is ultimately created towards the subject. The harder problems of L. C. M., G. C. M., fractions, factorisations, simplications etc. have little practical value. There should be lesser number of such problems. Rigorous problems on continued fractions, addition, subtraction of recurring decimals in Arithmetic, division and multiplication by the method of detached coefficients in Algebra may be elminiated.

7. Problems of Arithmetic may be solved by equations. It is better to introduce Algebra in earlier stages. Top priority should be given on equations and its applications. Students should be encouraged to slove problems on Arithmetic and Geometry by forming and solving equations.

8. Use of graphical representation should be given more importance in solving problems.

9. Computation of measures of central tendency, a useful topic in elementary statistics, may be included.

10. The Principle of variation can also be introduced. Problems of unitary method, time and work may profitably be solved by the Principle of variation.

11. 'New Geometry' based on the curriculum on 'New Mathematics' may be started in a graded manner from class V to class VIII.

12. The contents on 'New Mathematics' are being introduced in different states of India. So it is high time to consider whether such curriculum can be taken as an alternative course in mathematics at least in some of our advanced schools.

Teaching Learning Unit by the Mathematics Group

Topic—Equation and its applications—Class VIII

Introduction :

The pupils come across, as a result of daily experience, a number of typical problems in mathematics, physics and chemisrty and in other social sciences. The variable or the variables of the problem can be written in the form of an equation. The unknown variable can be found out by solving the equation. The solution of equations is, therefore, highly important in solving common problems of daily life and other problems of physical and social science. It is thus necessary to give top priority on the teaching of the basic concepts of equation and their process of solution.

Objectives :

1. The students should acquire knowledge in
   - (i) defining terms and recalling facts which will be useful in forming and solving equations,
   - (ii) explaining the concepts involved,
   - (iii) discriminating between the closely related terms, as for example, equation and identity,
   - (iv) detecting errors in definitions, and
   - (v) writing symbolic expressions.

2. The students should develop skill of computation which may be of the following kinds :
   (i) skill in fundamental operations of transposition in equations,
   (ii) skill in simplification of algebraical expressions,
   (iii) skill in checking each step before proceeding further, and
   (iv) skill in detecting errors and correcting them.

3. The students should learn to understand and apply the knowledge and skill in
   (i) finding what is given and what is required,
   (ii) finding symbolic representation from a verbal statement,
   (iii) finding identical relations from the verbal statement of the problem,
   (iv) forming equations,
   (v) examining the adequacy or inadequacy of data,
   (vi) verifying the result,
   (vii) drawing inference from the result,
   (viii) supporting the conclusion by reason,
   (ix) finding defects in invalid reasoning,
   (x) solving the problems of unitary method, percentages, simple interest, time and work, compound interest etc. by forming appropriate equations, and solving them.

Major Ideas of Content

1. Variable and constant—definitions, examples on variable and constant.
2. Equation and identity—definitions, distinction between the two, illustrations.
3. Formation of equations—
   a) Formation of symbolic statement—meaning of the symbol, writing symbolic representation from a verbal statement, illustrations.
   b) Writing verbal statement from symbolic representation with illustrations.
   c) Forming equations from verbal statements and illustrations.
   d) Verbal representations of equations.
   e) Every eqution is a problem.
   f) Roots of the equation.

4. Solutions of the equations—
   a) Solution of an equation like the form $ax=b$.
   b) Transposition—
      i) When equals are added on both sides then the result will be equals.

ii) When equals are subtracted from both sides of an equation then the result will be equals.

iii) Transposition of the equations of the form $ax+b=d$ and $ax+b=cx+d$.

c) Solution of equations of the form $ax+b=cx+d$ by transposition.

d) Solution of equations having longer expressions and having fraction and decimal coefficients.

5. Solution of different problems by forming equation and by solving them.

a) Writing symbol for the appropriate unknown to be found out.

b) Writing symbolic representations for verbal statement of the problem.

c) Writing equations.

d) Solving the equation and interpreting the result.

e) Checking the result.

Development of the content :

Variable and constant—The quantity which is fixed and unchangeable is constant. They may be numbers or algebraical symbols, e. g., 2 years, 5, a, c, etc. The quantity which changes and varies is a variable quantity, e.g., age of Ram, income of a man, etc. A variable quantity is usually expressed in terms of symbols like x, y and z.

Activities :—A student is asked what his age is. Bela says that her age is 12 and 12 is a constant. How many books does she possess? she has 4 books. Here number of books is variable and 4 is constant.

Equation and identity :

Students should be made to understand that an identity is a fact and an equation is a problem. For example, $a=\frac{2a}{2}$ is a fact. It is satisfied for all value of a. So it is an identity. But $x+1=2$ is a problem which is satisfied for an unique value of x which is 1. So it is an equation.

Activities :—Students will be asked to give a few examples of equations and identities. They will be asked to identify equations and identities from the following examples :—

(i) $2+2=4$ ii) $2+3x=4x$ (iii) $(a+b)^2=a^2+2ab+b^2$

(iv) $x+9=6$, (v) $5x=12$ (vi) $a^3=a^2.a$.

Verbal and symbolic expressions

Statements in language are verbal expressions and those in symbols are symbolic statements. Ram's age is a verbal expression. $5a+3$ is a symbolic statement. Sometimes we use symbolic expressions in place of verbal expression. For Ram's age, we put x, say.

Then twice Ram's age can be written symbolically as 2x. On the other hand, let us take a symbolic expression 2x + 2. This can be expressed in language in any of the following forms :

i) a number which is the sum of a double of another number and two,

ii) a sum of rupees which is twice the income of Badal plus rupees two, where x is Badal's income.

iii) sum of twice father's age and two years, where x is father's age,

and so on.

Thus a symbolic expression can be written in language in different ways by taking different meanings for x.

Activities : Pupils will be asked to write symbolic expressions for the following statements.

i) My pocket money is x. What is half of my pocket money minus two.

ii) One third of Kamal's income is 2p. What is double of Kamal's income ?

iii) Shyam's age is $\frac{q}{2}$. Twice of Rama's age is r. What is the sum of their ages ?

Pupils will also be asked to write two kinds of verbal statements for each of the following symbolic expressions.

i) 3x

ii) x + 2

iii) 2 P – a

iv) 3x – 7

Equation and its roots.

The teacher will ask the students to write a few equations. The equations are (i) $2x=2$ (ii) $x+3=4$ (iii) $x-2=3$. For what value of x, is the equation (i) satisfied ? $x=1$ satisfies the equation (i). Here 1 is called the root of the equation $2x=2$. The value of the unknown quantity which satisfies the given equation is the root of the equation.

Activities :—The teacher will ask the student to find out the roots of several simple equations by trial method.

Solution of equations of the form ax = b

Let us take the following equations $3x=9$, $4x=16$, $\frac{1}{2}x=4$. To solve the first equation we divide both sides by 3. Thus $\frac{3x}{3}=\frac{9}{3}$, ∴ $x=3$. Again to solve $\frac{1}{2}x=4$, we multiply both sides by 2. We get $x=8$. The teacher will advise the students to write 'or' before writing a new step.

Activities :— Students will be asked to find the value of x from each of the following equations $3x = 9$, $\frac{1}{5}x=10$, $\frac{1}{4x} = 13$.

Transposition and solution by Transposition :

To solve the equation $x + 4 = 5$, we may subtract 4 from both sides. In $2x - 3 = 7$, we may add 3 on both sides. If equal quantity is added to or subtracted from each of the two sides of an equation, the results will be the same. We may thus conclude that a quantity can be transferred from one side to the other by changing its sign. This is known as Transposition.

In order to find out the value of the unknown variable in an equation, the terms involving the variable are transferred to one side and the constant quantities to the other. It is convenient to keep variables on the left-hand side and the constants on the other side. After transpoition, both sides will be simplified and the value of the variable will be found out. In the third equation above, the problem lies in the process of simplification involving algebraical numbers. The students are to recall algebraical multiplication, division etc. and simplify the result. A simpler form of equation will ultimately be obtained.

Activities : A balance, several unknown weights and a weight box containing different weights are taken. An unknown weight and a known weight are placed on the left pan and it is balanced by several known weights on the right pan. Now if equal weights are added or withdrawn the resulting weights will be equal. Again if the known weight on the left pan and an equal weight on the right pan are withdrawn the weight of unknown weight will then be known This experiment will help the students to understand transpotsition.

The teacher will now ask to solve the following problems by transposition.

(a) $5x+8=18$ (b) $3x+2=8$ (c) $9x+5=7$ (d) $3x+6=x+8$ (e) $7x-9=9-3x$.

Solving equations having larger expressions, fractions, decimals or algebraical quantities.

The teacher will write the following equations.

i) $\frac{x}{6}-\frac{x}{5}=\frac{x}{15}-\frac{x}{3}+7$

ii) $\cdot 5x \div \cdot 7 = 7x - \cdot 2x \div 3$

iii) $x(x-a-b)=(x-2a)(x-2b)$

In the first problem, multiply both sides with the L. C. M. of denominators. Then the result will be an equation of the former type.

In the second equation, students will be made to recall that decimals can be reduced to fractions. On writing $\cdot 5x = \frac{1}{2}x = \frac{x}{2}$ etc., the students will reduce the equation into one having fractions.

Activities : Let us take the following equations

i) $17x-13(2x-5)=8(x-3)$

ii) $(6x+9)^2+(8x-7)^2=(10x+3)^2-71$

iii) $9x - \cdot 4x + 3 = \cdot 7x + \cdot 8$

iv) $\frac{x-a}{a-b} + \frac{x-b}{a+b} = \frac{a^2+b^2}{a^2-b^2}$

The teacher will ask the students how the sums differ, how these sums can be reduced into simpler ones and how they can ultimately be solved.

Reduction of algebraic expressions with several variables.

The teacher will write the algebraical relation $I = \frac{PTR}{100}$ and ask the students to write an expression of 'P' in terms of other symbols. This can be done by multiplying 100 to both sides and then dividing both sides by T R.

Thus $P = \frac{I \times 100}{100}$

Activities : The students will be asked to write expressions for T and R separately in terms of other respective symbols. The students may also be asked to find expressions for u, f, t also in terms of other respective symbols from the relation

$v = u + ft.$

Solution of different kinds of problems with the help of equations :

The teacher will write a few problems. For each problem, he will first ask the students to say what he is going to find out. Students will be advised to write x for the unknown quantity and find an equation from the given condition. The teacher will try to solve the given problem by asking questions and taking answer from the students. The teacher will rectify the wrong answers of the students.

Problem : Sum of the present age of father and son is 60 years. Ten years ago, age of father was thrice as that of his son. Find their present age.

Questions by the Teacher	Answer by the students
* A student will be asked to state his age	he says that his age is 12
* What is your age before 5 years ?	12 – 5 = 7 years.
* If present age of father is x, what was his age 10 years ago ?	x – 10
* What is the sum of present age of father and son ?	60 years
* What is the present age of son ?	60 – x
* What is the age of son 10 years ago ?	60 – x – 10 = 50 – x
* What was the relation between the father's age and son's age 10 years ago ?	Ten years before, fathers age = 3 × son's age.
* What is the equation of the above relation ?	x – 10 = 3 (50 – x)
* Solve it	or x – 10 = 150 – 3x or 4x = 160 or x = 40

* What is father's age ?	40 years
* What is son's age ?	$60 - x = 20$ years
* Check the result.	Putting $x = 40$ the relation is satisfied.

Problem :

240 students appeared in an examination which 192 students passed. what is the percentage of failures in the examination ?

Question by the teacher	Answer by the student
* What are we going to find out ?	Percentage of failures
* For what should we write x ?	For percentage of failures
* If x be the percentage of failure, what is the number of students who failed in terms of x ? (Here the teacher will help the students in recalling the concept of percentage)	$\frac{x}{100} \times 240 = \frac{12x}{5}$
* What is the number of students who failed ?	$240 = 192 + 48$
* Write the equation from the given problem.	$\frac{12x}{5} = 48$
* Solve the equation.	or $12x = 48 \times 5$ $x = \frac{48 \times 5}{12} = 20$
* What is percentage of failure ?	20%
* Check the result.	20% of $240 = 48$

Problem :—If I=Interest of a sum of money, P=Principal, T=Time of investment R=The rate of interest percent per annum, and the relation among them is $I = \frac{PTR}{100}$, at what time will the interest of a sum of Rs. 500 at the rate of 4% per annum, be Rs. 80.00. ? Apply the above relation.

Question by the teaeher	Answer by the student
* What is to be found out ?	The time
* What is the relation among principal, time, rate and interest ? (The teacher will help the students in recalling the concepts of interest)	$I = \frac{PTR}{100}$ Multiplying by 10C and then dividing by PR both the sides
* How can we write Tin terms of other symbols ?	$T = \frac{100x\ I}{PR}$
* What should we know in order to find out T ?	I, P and R
* What are the values of I, P and R in our problem ?	I = Rs. 80.00, P = Rs.500.00, R=4% per annum.

* Write the expression for T substituting the above values. $T=\frac{80x100}{500x4}$
* Find the value of T. T=4 years
* Check the result. Interest of Rs. 500 at 4% per annum for 4 years is Rs. 80.00

Attitude :

The teacher will try to arouse interest on the concept by solving life centric problems with equations. Interest may also be created by solving problems on arithmetic, geometry and science by forming and solving equations. The teacher may create a sprit of enpuiry by asking the reason for the following absurdity. "Dividing both sides of 2 (x—5) = 3 (x—5), by (x –5) ; we get 2 = 3. The meaning of energy equation $e=mc^2$ may be explained to the students which will give an idea of the applications of equations in different branches of knowledge.

The teacher will write the following problems and ask the students to solve them by forming and solving equations.

1. Sum of two numbers is 80 and their difference is 28 ; what are the two numbers ?
2. A chemist has a solution of 50% pure acid and another of 80% pure acid. How many grams of each will make 600 grams of a solution with 72% purity of the acid ?
3. If the density, mass and volume of a body be D, M and V respectively, then the relation among them is $D=\frac{M}{V}$

   If the mass of a body be 50 grams and its volums be 25 c.c., find the density of the body in grams per c.c. from the above relation.
4. If the temperature of the body in centigrade and Farenheit scale be represented by C and F respectively then the relation between two kinds of temperature is $\frac{C}{5}=\frac{F-32}{9}$

   In a certain day the temperature observed in centigrade scale is 60°. What is the temperature in the Farenheit scale on that day ? Take the help of the above relation.
5. The sum of the three angles of a triangle is 180 degrees.

   In a triangle, if the 1st angle is twice the 2nd angle and the 3rd angle is thrice the 1st angle, find the 3 angles of the triangle in degrees.

Evaluation :

The teacher should then draw out the scheme of evaluation of the objectives, skill, attitude and understanding of the pupils during the course of teaching. Some problems should be worked out in the class. Similar types of sums may be allotted to them as home assignment. In selecting the questions, evlautions of all kinds of concepts and subconcepts of the topic should be considered.

Also a unit test may be prepared which can be used for the measurement of achievement on the topic and for diagnosis of the specific difficulties on it.

SUMMAR VACATION WORKSHOP
JUNE 9 TO JUNE 18
1969

Report of the History group

The 9th June, 1969 marked the opening ceremony of a short course summer training under the valuable guidance of six resource persons, viz, Sri K. K. Chatterjee, Sri M. K. Roy, Sri P. Ghosh, Sm A. Roy, Co-ordinator, Sri G. Mitra and Sri S. Giri, at the Institute of Education for Women in the Hastings House. This training extended over three subjects of class VIII—History, Mathematics and General Science. The trainee-teachers were nineteen in number. We, the seven trainees of history department, were fortunate enough to have the constant advice of Sri Kamal Chatterjee, Sm Aparajita Ray and Sri Gangaram Mitra.

Sm Aparajita Ray, Co-ordinator of the Extension Services Department in her inaugural address explained the whole programme of the Teaching Learning Unit. The Unit work of this training was to be covered within a limited period of 10 days. Its sitting continued for nearly five hours daily with a half an hour recess. An Assembly discussion was conducted every day in the morning session. Afternoon sessions included group discussions and working out of problems arising out of the scheme of work.

The discussion of the Assembly session of the first day, centered round the "utility" of the "Teaching Learning Unit" and its significant role in improving class room instruction.

It was the common feeling of the participants that the changing social order demanded a new outlook in the field of education. The Teaching-Learning Unit was one of the useful educational schemes to serve that purpose. It aimed at achieving general as well as specific objectives of teaching and learning. The unit discussed the various problems related to the existing syllabus and suggested improvement or at least rearrangement according to the needs and facilities of the teaching and learning class as a whole. Unit planning equipped the teachers with clear objectives and enriched materials of teaching, imparted in pupils knowledge and understanding, enabled them to apply their knowledge to new situations, and developed skill in their behaviour pattern.

Discussion of the afternoon session was conducted under the guidance of Sri G. Mitra, Sri K. Chatterje and Sm. A. Ray. Here the topic 'French Revoulation' was selected as a teaching-learning unit. The objectives underlying the revolution were discussed along with a discussion on its content and methodological aspects.

The assembly discussion on the 10th June, confined itself on the "characteristics of the Teaching Learning Unit". It basically indicated a comprehensive planning of the entire syllabus with some broad objectives in view.

The group session dealt with the knowledge-objectives of the pupils on the French Revolution. A chart was drawn on the recall and recognition of facts of the Revolution.

The Assembly discussion on the 11th June reviewed the various problems concerning the syllabus and the traditional lecture method of approaching the problem.

In the afternoon session History-Group pointed out the difficulty of teaching due to inadequate supply of text-books, reference books and Hand books. At the end of this session some concrete suggestions envisaging useful changes in the present History syllabus of classes VI to VIII were put forward. It was strongly felt how essential it was to learn the national history rather than to have a fragmentary knowledge of the whole world at the middle school stage. Everybody opined that at least a few necessary changes in the existing syllabus could receive immediate effect.

In the morning session on the 12th June, the group sought to give a concrete shape to the suggestion of changing the heavy syllabuses of classes VI to VII. Then the session dealt with the understanding aspect of pupils' behaviour. Afternoon session completed the task of listing of understandings, the pupils were expected to acquire from the French Revolution.

The group discussion of the 13th June, 1969, reached the stage of application of understanding on the part of the pupils. Discussion continued on skills, desirable interests and healthy attitude which the students should develop within themselves from a through knowledge and understanding of the French Revolution.

In the afternoon session of the day the skill, desirable interests and special attitude of the pupil were detailed. A map of Central Europe was drawn as concrete example of the development of the pupils' skill and interest. The Group session on the 14th June, starts with a discussion on the content and time-line of the French Revolution. A draft of the whole content, divided into Sub-units and a time chart from 1774 to 1815 was drawn.

"Pather Panchali" with its universal appeal to humanity entertained us in the afternoon session.

On the 16th June, the morning session opened with a discussiou on the classroom procedure of teaching the French Revolution. It enlisted the activities of the teachers and the students in the class.

The visit of Sri N Sinha, the Secretary of the West Bengal Board of Secondary Education, makes the afternoon session effective and fruitful. Our suggestion on the change of syllabus receives his cordial acceptance.

The morning session of the 17th June brought into sharp focus the thought-provoking suggestion of Sri N. Sinha to include cultural history of Greece, Rome, China and Central Europe upto Reformation. The suggestion carried out unanimous votes in its favour, with the provision that the load of the syllabus must not be too heavy for the middle class students. The discussion on the general objectives of teaching history and the preparation of a list of teachers and students' materials added much to the working of the unit. It was decided that evaluation procedure and evaluation tools relating to this unit will be worked out in the next session. Here we indicate the broad outline of the evaluation approach concerning this unit.

In the evening session, the history group was busy with chiselling and pruning the pile of work of the last nine days.

The morning session of the 18th June, began with consolidating the works of the last nine days. The whole work was divided into two parts—

1) General objectives of teaching history and 2) The Teaching Learning Unit. The second part contains the following—

a) Introduction of the unit.
b) Unit objectives—knowledge, understanding etc.
c) Content-analysis.
d) Teacher-student activities.
e) Source materials for both teachers and students.
f) Evaluation (to be done in the next session).

The day being the last day of the session was highlighted by a small but pleasant function in the presence of Principal D. Mohanta of the Bureau of Educational and Psychological Research. Most thankfully, we convey our gratifying indebtedness to all present for giving us an opportunity to come closer to them.

In conclusion we gave vent to our feeling that the working of the unit under the assistance and wise counsel of the resource persons has greatly widened our mental horizon.

Names of the Resource Persons :

1. Sm. Aparajita Ray, Coordinator, Extension Service Department.
2. Sri Kamal Kumar Chatterjee, Evaluation Officer, Evaluation Unit of the Bureau.
3. Sri Gangaram Mitra, Lecturer, David Hare Training College.

Names of the participants :

1. Sm. Anjana Bose, Chandravag Srikrishna Girls' School, Howrah.
2. ,, Bijaylakshmi Dutt Roy, —do—
3. ,, Krishna Datta, —do—
4. ,, Senha Ghosh, Bagnan Girls' High School, Howrah.
5. ,, Mina Koley, Bishnupur Grihasri Sikshayatan, 24-Parganas.
6. ,, Hashu Pusilal, Prafulla Sen Girls' H. S. School, Naihati.
7. ,, Pratima Datta, —do—

SEMINAR ON HISTORY

FRENCH REVOLUTION

— INDEX —

3. Introduction of the Unit
4. Unit objectives
5. Content analysis
6. Teachers' and students' activities
7. Source Materials
8. Evaluation

A NOTE ON THE HISTORY SYLLABUS OF THE MIDDLE SCHOOL STAGE

(CLASSES VI to VIII)

In introducing the syllabus, the objective of History teaching at this stage (middle stage) has been defined by the Board in the following words : "to arouse the interest of the young learners and to focus their attention on the great and memorable epochs of human endeavour". The emphasis has been given on "the colourful and dramatic aspects in great events, great lives and in the life of the people in the past ages". The main approach of presenting the content would be, according to the Board, to show "the interrelations of various epochs" and "to give a broad sense of chronological sequence".

If we analyse the syllabus at this stage, we would find that effort has been made "to give a comprehensive view of history through ages", i.e. in class VI the Ancient World, in class VII the Middle Age and in Class VIII the Modern Age have been dealt with.

We present here, a few observations of the participants on the "dominant line of thinking" expressed through the aforesaid formulations :

1) It does not provide the knowledge and understanding about the history of students' own land. From the scattered information provided in the three periods (ancient, medieval & modern), they cannot form a total picture of India's past.

2) The syllabus does not serve the social purpose of effecting national integration and of rousing the attitude of international brotherhood on the basis of correct understanding of India's relation with the outside world.

3) From a sketchy narration of India's past at different epochs, it is impossible for any pupil to draw inspiration on the rich cultural heritage of India.

4) The principle, "from known to unknown", justifies the position that we should start from our own land. This well-known maxim is totally absent in this "line of thinking".

The aforesaid considerations lead us to advocate a total change in the current syllabus of History in the middle stage and suggest a new one.

CLASS—VI

A. 1. Early History of Man including the Indus Valley Civilization.
2. Life in the Vedic Age.
3. Life in the Age of Magadha.
4. Life in the Maurya Age.
5. The Age of the Satavahanas and the Early Tamils.
6. The Age of the Guptas.
7. The Age of Harshavardhana.
8. Greater India.

B. 9. The Story of Ancient Greece and Rome.

CLASS—VII

A. 1. The Rajputs.
2. The Age of the Turkish Sultans.
3. The Bhakti Movement.
4. The South.
5. The Great Mughals.
6. Decline of the Mughal Empire.
7. A brief history of Bengal from the seventh century to first half of the eighteenth century.

B. 8. Renaissance and Reformation in Europe.

CLASS—VIII

A. 1. The coming of the Europeans.
2. Establishment of British Dominion in India (1757-1856).
3. The Revolt of 1857.
4. The Indian Re-awakening of the nineteenth-twentieth centuries with special reference to Bengal.
5. The Nationalist Movement upto 1947.
6. India after Independence.

B. 7 Awakening in Asia in the twentieth century with reference to China and Japan.

The main emphasis of the Content suggested should be on the socio-cultural aspect rather than political aspect of History i.e. the content selected should emphasise the lives of people and the growth of social institutions rather than the history of dynasties, wars and battles.

We would like to mention, in this connection, our opinion in respect of the study of the landmarks of human civilization. It is agreed that each country is found today indissolubly linked with every other by economic, social and cultural ties. It is, also, accepted by all that human civilization is a world product and largely a matter of Indian culture and civilization demonstrates this aspect of human civilization very clearly.

For classes IX & X, when the pupils grow maturer and possess broad understanding of the landmarks of Indian History, a critical study of Indian History through ages may be suggested with special reference to the cultural influences of other lands which have direct bearing on the development of the synthetic character of Indian culture. In this way, the pupils should be acquainted with "the colourful and dramatic aspects" of the great events of World History. The History syllabus for classes IX & X should be same in secondary and higher secondary schools.

GENERAL OBJECTIVES OF TEACHING HISTORY

History is the study of man's evolution on earth. It is an everflowing stream of events and thoughts of the past, in the heart of which the evitable course of the future is shaped. History, being the study of human progress on earth, is taught with some general objectives in view.

1) History is a comprehensive study of humanity as a whole. So the objectives of teaching History are (a) to develop a clear and good understanding about the social order and (b) to help in forming an idea of national integration and international understanding.

2) National history gives the children a vivid idea about the past culture and civilization of their own land. Thus it fosters the spirit of patriotism in them.

3) History enables children to think over the present in the context of the past.

5) History aims at improving the power of reasoning. But the success of all these general objectives of teaching history, depends on its method of approach to the students.

The course of history is unchanging and continuous. It holds in its bosom chapters of both darkness and glories. These truths cannot be perverted, because history means truth. So to achieve these objectives children should be taught to differentiate the right from the wrong, the glories from the darkness.

INTRODUCTION OF THE UNIT

French Revolution (Class VIII)

The unit on the French Revolution occupies an important place in the teaching of World history. The motive force of the French Revolution was social in the first instance and political in the second. Long unaccustomed to self government the French people complained not so much of centralised despotism as of the disabilities imposed on them by the existing social system. In France cleavage between class to class was acute and the privileged classes enjoyed exemptions and advantages wholly disproportionate to their services to the

State. It was this social inequality which pinched the people most. So they wanted to abolish all privileges and to throw careers open to talent. On the other hand, intoxicated by the new ideas of liberty, equality and fraternity the French people sought to abolish the old Regime root and branch, and to bring about a new order of things. They aimed at the wholesale reconstruction of the social and political systems on the principle of the absolute Sovereignity of the people. Thus the movement was democratic.

Many intellectuals, viz. Rousseau, Voltaire etc. played important part for this new idea. They tried heart and soul to inspire people against the prevailing system.

It was not merely a local event. It burst the boundaries of France, carrying with it new ideas of social and political organisation and this in the long run helped to refashion Europe. Everywhere the people heard the siren song of Liberty, Equality and Fraternity. The cardinal idea of Liberty, personal and political, not only in France but all over Europe was recognised.

In the nineteenth century the influence of this idea is seen in a frowing social conscience and in the increasing recognition given to the interests of the great mass of people.

The history of Europe since 1815, has been the history of the growth of these ideas and though there was for a time a successful *absolutist* reaction, they have succeeded in gaining universal recognition. The Unit, easily helps in giving the pupils an idea of the forces let loose by the Revolution are potent even to this day and are working out visibly or invisibly the destinies of the nations of the world.

UNIT OBJECTIVES

Knowledge :

The pupil recalls,

a) Evils of absolutism :—
Louis XV was a weak ruler. So there was resentment among the middle classes at the pride and privilege of the nobility and upper clergy.

b) Inequality :—
French society was divided into two classes—privileged and unprivileged.

c) Ideas of the Philosophers :—
The idea of the philosophers like Rousseau, Voltaire and Montes Quieu inspired the general French society.

d) States General :—
Louis XVI was bound to call the States General and it was converted into National Assembly.

e) Fall of Bastille :—
Bastille was the store house of the prisoners, who stood against the king.

f) Fall of Assembly :—
The declaration of the rights of man.

g) New Assembly formed :—
The work was in the hands of moderate men, such as Bailly and Lafayette.

h) Fall of Monarchy :—
This episode heralded the end of the constitutional monarchy, Louis was deposed, the royal family was imprisoned in the temple.

i) September Massacres :—
In the September massacres some 12,000 royalists were killed. In the convention which replaced the assembly Girondins, now the moderates, were unable to save the king, who was executed on 21 Jan.' 1793. Queen Marie Antoinette followed him to the scaffold some months later.

j) Reign of Terror.
Reign of terror was the peried of terrorism, Jacobin club. Part played by Robespierre.

k) Rise and Fall of Napoleon :—

Napoleon Bonaparte was the most brilliant and successful general. He established the political authority not only in France but also all over Europe except Britain and Russia. He established the continental system. But Napoleon himself broke up the condition of the continental system. He was over estimated. His downfal was due to his own policy.

Summing up :—

The pupil recognises

a) Evils of absolutism :— Absolutism ultimately leads to resentment.
b) Ideas of the philosopher :— Ideas of the philosopher inspired the people.
c) Revolution was a violent process.
d) Reign of terror was a marvellous product of the practical statemanship. It also created a feeling of revulsion by its excesses and thereby hampered the cause of revoultion.

FRENCH REVOLUTION

Understanding :—

To enable pupil (i) to compare and contrast facts, (ii) to establish mutual relationship between facts and (iii) to point out the cultural mixture, if any.

With a proper understanding of the content of the French Revolution a pupil compares and contrasts :—

(1) The administrative policy of Louis XV and XVI with that of Napoleon.

(2) The forces of liberty, equality and fraternity at the time of French Revolution in terms of the forces prevailing in the present day world.

(3) The social condition of France under the absolutist Kings with the condition at the time of Napoleon.

(4) The Military success of Samudra Gupta with that of Napoleon ; and

(5) Between the ideas of the English Revolution and the revolution in France.

Application :—

At the stage of application, the pupil

(1) establishes the relationship of the idea of equality of the French Revolution with the idea—"career open to talent" of the present day world,

(2) draws generalisation between the motive force behind the policy adopted by the makers of the French Revolution with the frame-work of the present democratic form of government of India.

Skill :—

Skill empowers the pupil with an enriched capacity to draw maps, locate important places and chart significant events chronologically.

When a pupil acquires thorough knowledge and understanding on the content of the French Revolution, there develops in him the skill of —

i) drawing the map of Central Europe,

ii) outlining the extent of the kingdom during the reign of Napoleon,

iii) inserting on the map the exact location of Prussia, Austria, France, Britain, Russia, Spain, etc.

iv) preparing a time line from the beginning of the reign of Louis XVI down to fall of Napoleon.

Desirable interst :—

A pupil, skilled in history, acquires some desirable interest, so long latent in him.

After attaining skill on the French Revolution he is now interested to—

i) collect the pictures or draw the portraits of different personalities like Napoleon, Voltaire, Rousseau, etc.

ii) collect the curios of the time,

iii) visit the famous places of Bastille, of Tennis Courts—and also the place where the royal family was guillotined,

iv) collect the famous utterances of the philosophers such as Voltaire, Rousseau,
v) read books on the French Revolution.

Healthy attitude :—

There develops some special attitude in a student from reading history. Certain changes are noticeable in his behaviour patterns.
He developes :—

i) healthy attitude of promoting equality in social division,
ii) a constructive idea to build his own nation.

CONTENT ANALYSIS

UNIT :—FRENCH REVOLUTION

Sub-Units :—

1 — Condition of France.
2 — Bastille to Fall of Monarchy.
3 — Republic to reign of terror.
4 — Rise and fall of Napoleon, and the effect of Revolution.

Sl. No. of Sub-Units	Name of the Sub-Unit	Content analysis
1.	Condition of France	The Government of France was a highly centralised monarchy. The representative institutions which France had were one by one brought under king's control. The states general (the feudal Parliament of France) had ceased to exist. Hence the king ruled as an absolute monarch. Louis XV, was weak and frivolous, enjoying the sweets of the royal office, while shirking the responsibilities attached to it. The French society was graded top bottom and each grade differed from others in legal rights and in the enjoyment of powers and privileges. Broadly speaking it may be said that France was divided into two classes privileged and unprivileged. The material revolution of 1789 was preceded by

UNIT : FRENCH REVOLUTION

a revolution in the realm of ideas. This intellectual revolt was brought about by a group of French philosophers of whom the most prominent were, Montes-quieu, Voltaire and Rousseau. Their writings gave expression to the discontent and indignation which lay latent in the hearts of the French people.

After Louis XV, Louis XVI was the unhappy monarch under whom the long accumulating evils of France reached their culminating point. He was honest, well intentioned and had a genuine desire to serve his people. He wanted to reform the abuses that undermined the fabric of the State but he was weak and was easily influenced by others. He was bound to call the states general. The States general met on May 1789, on 17 June the third estate declared itself a national assembly and 20th June meeting on an adjoining Tennis court, took the famous Tennis Court Oath.

Sl. No. of Sub-Unit	Name of the Sub-Unit	Content analysis
2.	Bastille to Fall of Monarchy	Having recognised the National Assembly the king urged on by his courtiers sought to suppress it. The measures alarmed the people, for they believed that the king was determined to use armed forces in order to suppress the National Assembly. The mob of Paris rose in fury against the King. The enraged populace stormed the State prison called the Bastille which to the mob was an obvious symbol of tyranny and abuses of the old Regime. Having destroyed the feudal privileges of the nobles as well as the old constitution, the National Assembly set about framing the future constitution of France. The assembly in imitation of the American

UNIT : FRENCH REVOLUTION

usage formulated the principles on which the new constitution of France was to be based. These were enshrined in the famous Declaration of Rights which proclaimed all men are free and equal in rights and that sovereignity resides the people. This episode heralded the end of the constitutional monarchy. Louis XVI was deposed ; the royal family was imprisoned in the temple.

Sl. No. of Sub-Unit	Name of the Sub-Unit	Content analysis
3	Republic-Robespierre	The attempted flight of the king produced very serious consequences. It showed that at heart he was an 'emigre' and an opponent of the constitution. Hence the fidelity of the people to the cause of monarchy was shaken They no longer believed in the sincerity of his utterances and his oaths to support the constitution. A republican party was formed in the assembly and its members like Robespierre and Danton, held that the king had forfieted his crown and demended the establishment of a republic. When the moderate republican party disappeared from the assembly and the phase of the Revolution known as the Reign of Terror began, it was the darkest and the most terrible period of the Revolution. There were the Jacobins whose sole aim was to defend France and ensure the republic. The circumstances which had called forth terror had ceased to exist, and so its prolongation appeared meaningless and hideous. The terror of living under perpetual fear of death became intolerable. At last an opposition was organised against Robespierre and the convention outlawed Robespierre and his adherents. They were arrested on the 27th July and Robespierre way executed that day.

UNIT : FRENCH REVOLUTION

Sl. No of Sub-Unit	Name of the Sub-Unit	Content analysis
4.	Rise and Fall of Napoleon and the effect of Revolution.	The convention at last took up its long neglected task, the framing of a constitution for republican France. The executive was entrusted to a "Directory". Napoleon was then at Paris and he was entrusted with the task of defending the convention against the Persian-mob. He dispersed the mob, saved the convention and began his astounding career. The convention declared itself dissolved. Napoleon defeated the Austrians in Italy. The policy of the Directory was extending French influence in Europe. Then Napoleon managed to reach Egypt. He established the political authority not only in France but also all over Europe except Britain and Russia. He established the continental system, but Napoleon himself broke up the condition of the continental system. He was the most brilliant and successful general. But he was over estimated. His downfall was due to his own policy. Just like Reformation and Renaissance the French Revolution has brought a revolutionary change in the later period of history. The ideas of this revolution crossed the border of France and spread from country to country. This revolutionary ideas received a set back at the downfall of Napoleon. But ultimately this French revolution gave a new life to Europe and a new spirit to the success of Democracy everywhere.

TEACHERS' AND STUDENTS' ACTIVITIES

A) **Class-room procedure in general**

1) Discussion, exposition and questioning.
2) Use of Maps, charts, pictures, diagrams.

B) Students activities

1) Preparation of Map of Europe
2) Drawing of the time chart
3) Collection of pictures of the philosophers and the King and Queen
4) Preparation of Map of Napoleon's empire.

First Unit

Teachers activities

The teacher will :—

1) Display famous utterances of the Philosophers.
2) Present the pictures of Voltaire and Rousseau before the students.
3) Show a map of central Europe.
4) Show a time-chart.
5) Discuss about absolutism and States General.
6) Put questions on the impression of the students on the present system of government of India in the context of the French system.

Students activities

Students will :—

1) Note the famous utterances, collection of similar utterances on social inequality from the history of India and the world.
2) Draw a map of central Europe.
3) Prepare a time chart indicating the period upto 1789.

2nd Unit

Teachers activities

Teachers will :—

1) Pose problem before the students and help them to solve.
2) Show the picture of Bastille and Marie Antoinette·
3) Discussion on the content :— Bastille to fall of monarchy.

Students activities

Students will :—

1) Note the lessons.
2) Learn to point out Points.
3) Write the stories briefly.
4) Solve the problems, put before them with examples of Indian History.

3rd Unit

Teachers activities :

Teachers will :—

1) Discuss about the Republic part played by Robespierre, Reign of Terror.
2) Show the picture of Robespierre.

Students activities

Students will :—

1) Note the lessons.
2) Differentiate the Republic from the monarchy.
3) Distinguish between the "Reign of Terror" & "Terrorism in India".

4th Unit

Dramatisation Method (Rise and fall of Napoleon will be depicted in a drama)

1) Discussion of rise and fall of Napoleon and effect of Napoleon.
2) Show the extent of Napoleon's kingdom and the States dependent on Napoleon.
3) Locate France, Prussia, Austria, Spain, Egypt, etc.

4th Unit

Students activities

Students will :—

1) Note the lesson
2) Draw the map of Napoleon's kingdom.
3) Prepare a time chart beginning from the reign of Louis XVI to the downfall of Napoleon.

SOURCE MATERIALS

Students Materials :—

1) Text book
2) Text books of the same class written by different authors.
3) Children's Encyclopaedia.
4) Simple source books.

Teachers Materials :—

1) Text book
2) Text books of the same class written by different authors.
3) The world book of Encyclopaedia.
4) Ketel bey—A History of Modern Times
5) Adhunik Biswakatha—Shyamadas Bhattacharya and Nikhil Ranjan Roy.
6) Madhy Juger Europe—Dr. Kiron Choudhury.

EVALUATION

Evaluation procedure and evaluation tools relating to this unit will be worked out in the next workshop. Here we indicate the broad outline of the evaluation approach relating to this unit :—

1) Questioning items covering different objectives will be formed, viz, knowledge, understanding, application, skill etc.
2) Stress will be given on short answer type question-items, because they will ensure greater content coverage.
3) Some question-items testing skill objective will also be constructed.
4) Pupils' ability to think critically and creatively will also be tested through appropriate question-items.

In short, the testing procedure should also be objective based.

Students activities

Students will—

1. Take the [illegible]
2. [illegible]
3. [illegible]

4th Unit

Demonstration Method : The [illegible] of [illegible] will be depicted in a drawing.

1. [illegible] and effect of [illegible].
2. [illegible]
3. [illegible]

5th Unit

[illegible]

Students will—

1. [illegible]
2. [illegible]
3. [illegible]

SOURCE MATERIALS

Teaching Materials

[illegible]

Teaching Methods

[illegible]

EVALUATION

[illegible]

WORKSHOP

ON

DEVELOPMENT OF INSTRUCTIONAL MATERIAL

June 17 to June 26, 1970

Sm. APARAJITA RAY
Co-ordinator

Dr. KALYANI PRAMANIK
Principal & Hony. Director

DEPARTMENT OF EXTENSION SERVICES
INSTITUTE OF EDUCATION FOR WOMEN

WORKSHOP

ON

DEVELOPMENT OF INSTRUCTIONAL MATERIAL

Teaching-Learing Units

ON

Civics & Economics, Logic and Bengali

JUNE 17 to JUNE, 26, 1970

DEPARTMENT OF EXTENSION SERVICES

INSTITUTE OF EDUCATION FOR WOMEN

CALCUTTA-27

FOREWARD

This is a report of the activities the Workshop on preparation of Teaching Learning Units on Logic, Bengali and Economics organised by the Extension Services Department, Institute of Education for Women, Alipore, Calcutta-27 in collaboration with eminent educationists who work in these particular fields from 17/6/70 to 26/6/70 during the Summer Vacation 1970.

The subjects and topics were actually selected by the teachers of schools concerned for improving the quality of teaching in those particular fields of learning. The problems of teaching the chosen topics were discussed and improved methods of teaching were planned. Altogether 24 teachers from various girls' schools of West Bengal participated in the workshop.

Sri Sudhir Chandra Ray from David Hare Training College, Sri Amar Bose from Ballygunge Govt. Sehool and David Hare Training College (Part time). Sri Prabodh Kumar Das Mahapatra from Jagabandhu School and Sri Kanailal Banerjee from Calcutta University acted as resource persons.

We earnestly expect that this account of the activities organised by the Department of Extension Services will be helpful to all concerned. We thank heartily all the participants and resource Persons for their kind cooperation and making the workshop a success.

Kalyani Pramanik
Principal & Hony. Director
Department of Extension Services
Institute of Education for Women

THE SUMMER VACATION WORKSHOP

JUNE 17 TO JUNE 26, 1970

A SHORT REVIEW OF THE SUMMER VACATION COURSE

[CIVICS AND ECONOMICS GROUP]

We must be feeling very proud to have in our midst a team of scholars who have evidently specialised in different subjects by dint of their evident merit and sound sagacity. It is indeed a great privilege for us to benefit by what they said to us in a series of short lectures on the importance of teaching methods in Economics and Civics, Bengali and Logic.

On the inauguration day of the course (the 17th June, 1970) Dr. Kalyani Pramanik, the Principal of the Institute and the Director of the Extension Services Department, presided over the function. She welcomed us all and remarked that the responsibility of the teachers was not only to know some new methods but also to apply and evaluate those in the proper perspective. Then Sja Aparajita Roy, Co-ordinator, explained the objectives and value of this course in the fields of both Methodology and Contents and introduced the experts with all the teacher-trainees attending the workshop that started on the 17th June '70, and ended on the 26th June, 1970.

Sri Probodh Krishna Das Mahapatra, one of the experts in the Economics and Civics, suggested that in place of short-training course there should be week-end course. In his opinion, the time fixed for the Short Course Workshop was too insufficient to help us properly.

Sri Sudhir Chandra Roy, Assistant Professor, David Hare Training College, in his pedagogical speech made us recall the importance of Bengali in our practical life situations. He laid stress on the correct and ornamental uses of Bengali Grammar in the process of teaching.

Sri Kanailal Banerjee, Lecturer in Economics and Civics of the Education and Teachers' Training Department, University of Calcutta, pointed out in his welcome address that the degree of dynamic element in Economics was the most important of all the Art-Subjects. To depend upon just a few presented books for the pupose of teaching such an enlightened subject meant a progressive contraction of the range of teacher's knowledge. He also opined that in order to know 'what to teach' we must know 'how to teach' as well as 'why to teach'.

Sri Amar Bose in his illuminating address laid special stress on the scope and object of Logic. According to Sri Bose our so-called process of teaching does not generate proper attitude for the subject. Hence we should properly learn how to make rational application of the content in our daily life.

Under the able guidance of Sri Kanailal Banerjee and Sri Probodh Krishna Das Mahapatra, the Economics Group of the workshop selected 'Capital' as the teaching Unit.

The group enlarged the topic in slow degrees in accordance with the proforma given by the department of "Extension Services" and prepared instructional materials as per the direction of the authority concerned.

In the department of Logic the group consisting of six trainees chose 'Denotation and Connotation, of a term as teaching unit under the able guidance of a resourceful person, Sri Amar Bose The aforesaid topic was dealt with at length by the joint co-operation of the teacher and the taught and within ten days all the problems regarding the topic were creditably solved by the group concerned.

Apart from it, Bengali Group decided to work on the problem "Characteristics and functions of Infinite Verbs" under the adept guidance of Sri Sudhir Chandra Roy. The said group first of all surveyed different literatures of reputed writers and then attacked the usual definition of 'infinite verb' given in Bengali Grammar. Hence, under the thoroughly proficient direction of our distinguished resource persons we were able to get over our difficulties and problems in teaching.

Moreover, an excursion was arranged by the sponsors of this course to 'Britania Biscuit Company'. The excursion in which the spontaneous participation of both the teachers and the trainees took place came, however, to us as a source of great inspiration to "learning by doing". Over and above this general meetings were held on the 19th and the 22nd June and on the last day, a general assembly was held for the reading of the final report which consisted of the whole work done during the course. A small interesting programme, however, took place on the parting day. All the trainees took an active part in it.

Thus, in fine it may be noted that this Short Course was a complete success. We wish that such courses may often be held for the benefit of the teachers Lastly, we offer our heart-felt thanks to our teachers and sponsors of this course.

Participants of the Economics and Civics Group.

TEACHING UNIT — CAPITAL

INTRODUCTION (OVER VIEW)

Capital is the centre round which the Science of Economics clusters. It compared to the blood circulation of the human body failing which the whole bo inactive and worthless.

Apart from this, the growth of capital is indispensably necessary anaemia of the economic life of an underdeveloped country like I ded to do so. study of capital helps to know the economic conditions of natio n general sense cannot and well-informed about the extent of our natural resources and th onsidered capital.

India is enriched with vast resources, but owing to the by themselves be considered can scarcely be utilised properly. Hence follow in the g an income, then those are to unemployment and low per capita income, inspite of our through the implementation of three five-year plans in o Economics therefore should meet up the problem in its its remedies.

In this connection it should be remembered by every st accumulation of capital is not the function of a few persons but of all So everyone must know what capital is and what part it plays in the of a country, both developed and developing. Last but not the least poin ved up labour that a detailed study on 'Capital' and its realisation greatly helps the p proper attitude to the necessity of capital for the development of a country— underdeveloped counrty like India.

Hence in order to make our country prosperous and flourishing a firm emp apital 'Capital' should be laid out. ocial

Edited by
Kanailal Banerjee, Lecturer, Teachers Training
Department, University of Calcutta.

PROFORMA
INSTRUCTIONAL MATERIALS

SUBJECT	TEACHING UNIT	LENGTH OF TIME REQUIRED	CLASS	NAME OF PARTICIPANTS
So... omics	'Capital' with special reference to India	5 periods of 40 to 45 minutes	IX	Trainees : Ratna Jana; Tapati Bhattacharya, M.A.; Pranati Goswami B.A. (Hons), B.T. Resource Persons : Sri Kanai Lal Banerjee M.A. B.T.; Sri Probodh Krishna Das Mahapatra M.A. B.T.

Ap...
and functio...
The said grou...
the usual definition...
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difficulties and problems ...

Moreover, an excursi...
Biscuit Company'. The exc...
the teachers and the trainees t...
to "learning by doing". Over...
22nd June and on the last day, ...
which consisted of the whole w...
however, took place on the pa...

Thus, in fine it m...
wish that such courses ma...
our heart-felt thanks ...

A
Concepts (Basic Understandings or Big Ideas)

...of unlimited wants with limited resources.

...pt of utility of economic goods.

... goods and Commodities are turned into wealth.

...The process of transformation of wealth into Capital.

Capital is one of the significant factors of production with some distinct characteristics of its own.

...cond group of concepts :

[1] Capital plays a significant part in the progress of human civilisation.

[2] Capital is necessary for the growth of economic development of an under-developed country like India.

[3] Accumulation of Capital is not the function of few persons but of all the people of a country.

[4] Growth of Capital is the key to the solution of unemployment problem of our country.

[5] Growth of Capital of a country gives security to her own people at home and promotes potentiality of the people and the prestige of the country abroad.

B

Content Outline

I. Features of Capital.

II. Some definitions.

III. Different kinds of Capital.

IV. Functions of Capital.

V. Growth of Capital.

VI. (i) Hindrances to the Capital formation in India.

(ii) Remedies to those hindrances.

I. Features of Capital :

(a) It yields an income or aids the production of an income or is intended to do so.

(b) Capital may be regarded as wealth or property but property in general sense cannot be considered capital.

(c) It can be valued in money but money alone cannot be considered capital.

(d) Security papers such as shares, bonds etc. cannot by themselves be considered capital but when these earn the capacity of yielding an income, then those are to be regarded as capital.

(e) It is the result of past labour.

(f) It is the result of past saving.

(g) It is both productive and prospective.

II. Some Definitions :

(a) Capital is "produced means of production".

(b) Capital has been defined by Wicksell as "a single co-herent mass of saved up labour and saved up land, which is accumulated in the course of years.

III. Different Kinds of Capital :

Capital may be classified as private and social. A Government wardloan is Capital from the standpoint of the person given such loan but is not capital from the social standpoint.

(a) Consumers' Capital and Producers' Capital :

Consumers' Capital consists of those finished products on which the consumers live while producing, eg houses, clothes, food etc.

Producers' auxilliary or instrumental Capital consists of all goods which aid labour in production, eg, Tools, machines, factories, docks etc.

(b) Fixed and circulating Capital :

Machines, tools, etc. produce products for earning income but after producing this the existence of those instruments does not go exhausted. But cotton, on the

other hand, when it is used as capital for producing clothes gets exhausted and does not remain as it is. The former is the example of "Fixed Capital and the later of the 'Circulating Capital'.

(c) Sunk and Floating Capital :

Money when invested in machines and tools remains locked up there. This type of capital which is specialized and limited to a particular use ; eg. power is called sunk capital. After a period the value of the machinaries depend upon their productivity. These machinaries are known as old investment.

The command of goods in the form of a given money value which can be applied to any purpose is described as Free or Floating Capital.

(d) Real and Money Capital :

Land, Factory, productive implements and the stock of finished goods of the producer are called 'Real Capital' or 'Trade Capital'. Roads, shops, ports etc. in society are also considered real capital because all these help much to the social production.

Money used in a country as invested capital is called money capital. This kind of capital is however, only personal and not social.

IV Functions of Capital.

(a) Capital provides labour with tools and implements and hence makes labour much more productive.

(b) It promotes the efficiency of labour.

(c) It enables the producers to get command over stocks of goods and other materials and thus help him in round about and very productive methods of production.

(d) It decreases the cost of production.

(e) The increase in the use of capital leads to specialisation and division of labour. It also enables the producer to produce in large scale.

(f) It not only gives tools to labourers but gives subsistence to them during the process of production.

(g) It synchronises labour and consumption. The labourer has not to wait for the finished product to be sold. He gets his daily wages and consumes consumption goods with the help of it

(h) The capital helps labour with materials of industry and with materials of almost every variety and complexity.

(i) The producer must also have Capital to guard against centingencies and unforseen circumstances. The greater the participation of Capital, the more round about the process of production. It shortens the period of a particular mode but may lengthen the period of the entire process. From the standpoint of society Capital leads to continuity of production.

(j) The use of Capital makes the supply of other factors of production easier.

V. Factors for the growth of Capital :

Growth of Capital depends on the volume of saving and investment. Savings depend on the level of money incomes of the people and number of other factors. If incomes are so low that nothing remaines after meeting the bare necessaries of life, the volume of savings must necessarily be small. This is the case with the underdeveloped country like India.

Saving means abstaining from present consumption. Investment in its turn means to use that savings for more production.

Volume of savings depend on three factors, viz.—

[a] Propensity to save.

[b] Ability to save.

[c] Opportunities to save.

[a] Propensity to save depends on the following factors or motives :

1. Motive of prudence.
2. Motive of foresight.
3. Motive of family affection.
4. Motive of pride.
5. Motive to serve society.
6. Motive of avarice.
7. Transactionary motive.
8. Speculative motive.

[b] Ability to save :

It depends on the level of income. As the per-capita income increases, the ability to save also increases

[c] Opportunities to save :

It depends on the following factors :

1. The stability of the Government.
2. The provisions of developed banking system—postal savings bank, co-operative societies, Insurance companies and Provident Funds etc.
3. High expenditure tax.

VI. [i] Hindrances to the capital formation in India :

Volume of saving in India is very low for the following reasons :

[a] low per capita income.

[b] excessive rise of price level.

[c] lack of introduction of scientific methods of agriculture.

[d] fear of nationalisation of industries.

[e] effects of social customs like marriage.

[f] insecured social status.

[g] impact of population.

[h] increase in conspicuous expenditure.

[i] mal-hoarding of savings.

[j] mal-investment of savings.

[ii] Remedies to those hindrances :

[a] In order to increase the volume of savings in India per capita income and national income must be increased.

[b] The government should collect money through public loan—like prize bond, national saving certificate etc.

[c] The introduction of Company Provident Fund system, Insurance etc. should be welcomed.

[d] Establishment of more banks, post offices and co-operative socities is necessary.

[e] Nationalisation of banks is required.

[f] Reform of tax system is to be undertaken and large-scale evasion of taxes is to be stopped.

[g] Restriction on the production of luxury goods and on its rationing is needed.

[h] Importance of the import and production of machinery goods is to be highlighted.

C

Unit Objectives

I. Knowledge . Understanding.

To help the students to understand the following :

1. Capital is one of the factors of production.
2. It differs from other factors of production.
3. It has some distinct characteristics of its own.
4. Features of an underdeveloped country like India and the role of Capital for the progress of our country.
5. Income, savings and investment and how they are converted into Capital.
6. The functions of Capital.
7. The hindrances to the growth of Capital in India and their remedies.

APPLICATION

To enable the students to :—

1. take part in the discussions about the hindrances to the growth of capital in India and their remedies.
2. collect statistical data about the accumulation of capital of India for a specific period of time.
3. realise the impact of growth of population on capital.
4. infer and generalise factors using disguised unemployment of the rural sector in the capital formation of the country.

II. SKILLS

To enable the students :—

1. To prepare chronological charts showing various stages of growth of capital of our country from statistical data.
2. To prepare tables and diagrams on the topic.
3. To collect information about it to make a comparision with the growth of capital of other countries viz, U. K., U. S. A., Japan etc.
4. To organise debates, seminars, discussions—formal and informal on this topic.
5. To develop the art of presentation and writing.
6. To assimilate various ideas and to prepare and present reports on them.
7. To publish weekly economic 'wall magazines' and organise 'Economic Corner' in the school.
8. To prepare album on economic topics.

III. INTEREST :

To enable the students to take interest in :—

1. Unemployment problem of India.
2. The problem of Capital formation in India.
3. The protection of national wealth.

ATTITUDE

Enable the pupils to :—

1. Refrain from useless consumption.
2. Grow habit of saving and converting them into Capital through promotion of investment.
3. Participate in the productive activities of both home and school.
4. Become duty-conscious and plan-concious.
5. Grow an attitude towards proper utiliasation of natural resources.
6. Grow hatred against excessive and co-ercive methods hindering capital-formation of our country.

7. Refrain from the use of smuggled goods.
8. Grow an attitude to the promotion of exports causing capital-formation.
9. Establish and protect the capital forming institutions—such as banks, post-offices, co-operative socities etc.
10. Realise the government policy for checking the growth of population.
11. Tolerate and show respect to the opinions of others.

D

Class room Procedures

I. MOTIVATION—to be aroused by

[i] Showing pictures of plough, tractors, machines etc.

[ii] Exhibiting booklets containing pictures of projects.

[iii] Asking questions about the production of furniture within the class-room.

[iv] Displaying models of river valley projects and hydro-electric projects.

[v] Making meaningful references to Defence Certificate, preminm prize bonds, securities, Pass-books, cheques of Bank, Savings Bank Deposit, Pass Book of Post Offices and tickets of State Lotteries etc. in relation to its parts played in the capital formation of the country.

[vi] Inducing the Students to read the history of financial and industrial institutions.

[vii] Arranging film show depicting activities of governments and other financial institutions for the capital formation of the country.

II. Teaching Procedure :

1. To introduce the pupils with the subject matter through question and answer method.
2. To proceed with the subject matter in such a way as will enable the students to come to a conclusion.
3. To raise some modern problems through questions on the displayed materials on Capital and Capital formation in India.
4. To give a comparative view on the rate of growth of capital of different countries from bulletins and economic journals.
5. To divide the class on the basis of problems raised on "Capital and factors of Capital formation in India." One group will ask questions and the other will answer. The group leaders will sum up the points.
6. To give reference of books consulting the chapter.
7. To give asignment.

E

Students Activities

The students may be asked :

1. To collect :
    - [a] Reference books.
    - [b] News reviews.
    - [c] Paper cuttings.
2. To prepare :
    - [a] Table on classification of capital.
    - [b] Charts, diagrams and graphs on the yearwise growth of capital in India.
3. To take part in discussions (formal and informal) on the problems of capital formation and their remedies.
4. To maintain scrap books to note the points on discussions.
5. To visit industrial and financial institutions located near their school.

F

Students Materials

1. Text books :
    - [a] Arthavidya O Pourabigyan Parichaya—Arun Sen.
    - [b] Arthasastra O Pouraniti—Subrata Gupta
2. Scrap books.
3. Practical khata for preparing chart, diagrams etc.
4. Graph papers
5. Economic journals.
6. Drawing sheets.

G

Teachers' Resources

I. Text books :

1. Arthavidya O Paurabigyan Parichaya (For Humanities)—Arun Kumar Sen.
2. Artha Sastra O Pauraniti (for H. S.) Subrata Gupta.

II. Reference books :

1. An Introduction to Economic Theory—Sen and Das.
2. Indian economy—its nature & problems—Prof. Alok Ghose.
3. Problems of Capital formation in undcrdeveloped countries—Nurkse Regnar.
4. Planning for an expanding economy—Vokil C N. & Brahmananda P R.
5. The conditions of economic progress—Clark Colin.
6. Theory of Economic growth—Lewis.
7. Economic Analysis—Boulding K.
8. Lectures on Political economy (Vol I)—Wicksell.
9. Poverty & Capital development in India—D. K. Ragnekar.
10. Artha Sastra O Paurabigyan Siksha Paddhai —Probodh Krishna Das Mahapatra.
11. First, Second, Third Five year Plans—Govt of India Publications
12. Fourth five year Plan 1969-74—Govt. of India publication.
13. Sikshan Prasangay Arthanity O Paurabigyan —Gourdas Halder
14. Reports of this 'Finance Commissions'—Published by Govt. of India.

III. Journals :

1. Current affairs.
2. Calcutta Review.
3. Arthik Jagat.
4. Desh (Bengali Journal)

H
Teaching Aids

The teacher may introduce the following teaching audiovisual aids :

1. Physical map of India.
2. Industrial map of India.
3. Booklets published by the state Government.
4. Diagrams, charts, tables and statistical data on the topic.
5. Models on different river valley and hydro-electric projects.

I
Evaluation : Procedure and Techniques

I. Objeetive type questioas.

[a] Multiple choice type—

Tick out the Correct answer.

1. Capital is :
   [i] nothing but stored wealth
   [ii] hoarded money
   [iii] produced means of production

2. Capital helps labour with :
   [i] materials of household consumption
   [ii] materials of industry
   [iii] materials of foreign trade.

3. Volume of savings depends on :
   [i] the level of money income
   [ii] national production
   [iii] banks and post offices.

[b] True or False type.
Tick the correct word from the underlined answers :

1. Use of Capital increases / decreases output.
2. Capital grows out of expenditure / saving.
3. India is a developed / developing Country.
4. Capital decreases / increases productivity of labour.

[c] Matching type :

Match the following to make correct pairs :—

A	B
1 Saving means	[a] to use the money for more production.
2. Community savings depend on	[b] willingness to save and ability to save.
3. Investment means	[c] refraining from present consumption.
4. Growth of Capital depends on	[d] spread of education.

[d] [i] Below is given a list of countries. Prepare two lists, one having developing economy and the others having developed economy.

Japan, India, U.S.A., U.K., Pakistan, Israel, U.S.S R.

[ii] Below is given the name of some commodities. Prepare two lists one containing consumer's commodities for household consumption and other containing capital goods.

Rice, Plough, Motor Car, Weaving machine, Electricity, Coal, Apple, Sewing Machine, Tractor.

[e] Collective evaluation :

The students will perform debates on the following topics.

[i] Refraining from the consumption of smuggled goods is necessary for the growth of capital in India.

[ii] The introduction of state lotteries is a negation to the capital formation of a democratic state like India.

II. Short question type :

1. Give the definition of Capital by "Wicksell".
2. What do you mean by fixed and circulating capital ?
3. Give two main functions of Capital.
4. Why is Capital regarded as the 'produced means' of production ?
5. What is consumer's goods ?
6. Distinguish between consumer's goods and producer's goods.

III. Essay type questions :

1. What is Capital ? What are its characteristics ?
2. What are the functions of Capital ?
3. Indicate the factors that promote the growth of capital in a country.
4. What are the factors that hinder capital formation in our country ? What measures have been adopted to remove those hindrances ?
5. What should be the role of consumers in the growth of capital of an underdeveloped country like India ?

IV. The students should maintain scrap books regularly and submit to the subject teacher twice a year.

V. The teacher will maintain cumulative record cards to evaluate the achievements and attaintments of the pupils individually and collectively.

J

Additional Comment :

The instructional materials prepared by the workshop may be modified according to class room environment.

Successful implementation of the scheme as well as the materials prepared by the Workshop depend on the hearty co-operation of the Education department, Board of Secondary Education and the Institute where to be implemented.

Hence the subject teacher should be given ample opportunities and scopes to guide his students in accordance with the devised plan. Apart from it the subject teacher should be supplied with all the materials neessary for the fruitful implementation of the scheme by the institution. In addition to the hitherto suggested recommendations it may be reiterated that the Education Department should come forward with benevolence and catholicity

sanctioning special grants for the translation of the newly devised plan into reality. Another suggestion that deserves mentioning is that no subject teacher should in any way be prevented from attending such workshop, and because such welfare motivated, progress oriented and paedo-centric 'workshop' goes a long way in shaping the destiny of classroom teaching, each attendance in the workshop should be counted not only as 'on duty service' but as obligatory or compulsory.

Edited by :
Kanailal Bandyopadhyay
Lecturer, Teachers' Training Department
University of Calcutta

SUBJECT : LOGIC (Deductive Logic)

Teaching Unit : Denotation and Connotation of Terms.

CLASS—IX

Length of Time Required : 4 periods of 45 minutes each

Introduction and Scope :

The chapter on Denotation and Connotation of terms is a very important one in the study of Logic. Logic proposes to teach the nature and the procedure of correct thinking. And one of the very important requisite for correct thinking is unambiguous use of terms. In order to achieve correctness of thinking one must have clear knowledge about the meaning of terms one uses. Therefore the meaning of terms is very important for Logic. The Study of the chapter on 'Denotation and Connotation of terms' helps us to understand the deeper meaning of a term. Denotation refers to the numerical side of a term and Connotation to its qualitative side. Denotation in other words, refers to the extensive side of a term and Connotation refers to the essential qualities which are implied by a particular term.

Major Concept :

A detailed discussion on what Denotation and Connotation indicate or imply and their relationship among themselves, together with the exceptions.

Objectives :

(1) Knowledge—To help the students to have clear knowledge about Denotation and Connotation of terms—to enable the students to from a thorough knowledge about the chapter so that they do not feel any difficulty while studying later chapters like distribution of terms, definition of terms, division of terms etc

(2) Skill—To sharpen the skill of logical operation ; to help develop pupils' reasoning power and clear understanding of the meaning or significance of any term.

(3) Appreciation—To enable the students to appreciate analytical and abstract thinking.

(4) Application—To enable the students to apply the knowledge gained in this chapter to their day to day deliberations ; thus help them to become scientific minded.

The contents of the chapter on Denotation and Connotation may be divided into the following four units for the purpose of teaching :—

(1) Extensive and Intensive meaning of the terms, i. e. what is Denotation and Connotation.

(2) Determination of Connotation.

(3) Relation of Inverse Variation between Denotation and Connotation of terms—Four rules.

(4) Exceptions to the relation of Inverse Variation.

Unit Number—I

Denotation of a term means the number of things to which the term is applicable, in the same sense. Connotation of a term means the essential attributes which it implies or on account of which it is so-called.

Unit Number—II

The Connotation of a term may be determined in three ways, viz., a] Subjectively i. e. the qualities suggested or known to the individual subject at a particular time ; b] Objectively i. e. the qualities actually existing in the objects known or unknown ; c] Conventionally i. e. the essential qualities determined by scientific research or fixed by general agreement. But it is generally agreed upon that Logic is concerned with the scientific or Conventional Connotation.

Unit Number III

The relation between Denotation and Connotation is one of Inverse Variation. The following four rules may be mentioned in this connection :—

(1) The Denotation increases while the Connotation decreases :

(2) The Denotation decreases while the Connotation increases :

(3) The Connotation increases while the Denotation decreases :

(4) The Connotation decreases while the Denotation increases :

Unit Number IV

Exceptions to the above rules :—

The relation of inverse variation does not apply to the Denotation and Connotation of a single term. Moreover the relation of inverse variation must not be understood in any strict mathematical sense.

Teaching Hints

Class Room Procedure .—

The teacher will ask the students to give some examples of terms. Then they will be asked what they understand by each term. In this way the teacher will proceed by question and answer method. The teacher will follow the inductive method i. e. he shall proceed from particular examples to general rules.

Demonstration by the teacher :—

The teacher will take the help of various charts to facilitate pupils' understanding. Illustrations of how the increase in Denotation is followed by Decrease in Connotation and

vice versa will be given by the teacher. The relation of inverse variation shall be shown clearly by diagrammatic representation. The teacher shall present before the students some examples from daily life. The traditional diagrams given by Aristotle are to be illustrated.

Students' Activity

The students will prepare the following charts :—

(1) A diagram showing how the increase in Denotation is followed by the decrease in Connotation.

(2) A diagram showing how the decrease in Denotation is followed by the increase in Connotation.

(3) A diagram showing how the increase in Connotation is followed by the decrease in Denotation.

(4) A diagram showing how the decrease in Connotation is followed by the increase in Denotation

(5) A diagram showing the relation of inverse variation between Denotation and Connotation.

In drawing these diagrams the studen will be encouraged to use those examples which were not used by the teacher in the class room.

Materials Required

(1) Paper for preparing the charts.

(2) Different shades of colour to indicate the increase and decrease in Denotation and Connotation.

(3) A compass to draw circles.

(4) Text and other reference books.

Reference Books for Teachers :—

1. Modern Introduction to Logic – L. S. Stebbing
2. An Introduction to Logic—Russell
3. Introduction to Logic and Scintific Method – Cohen & Nagel
4. An Introduction to Logic—Joseph.

Reference Books for Students :—

1. Logic—Carveth Read.
2. The Elements of Logic—Deductive and Inductive—K. D. Sen.
3. Logic—B. N. Roy
4. Logic—J. N. Mullick

With a view to testing what the students have learnt from the lesson the following questions may be put to them :—

Objective Type Questions :—

1. Underline the correct answer :—

The Connotation of a term is its—

a] accidental qualities.
b] common essential artributes.
c] description.

The denotation of man is—

a] all men — past, present and future.
b] present men of the world.
c] only the civilised men.

The connotation of a term is determined—

a] subjectively.
b] Objectively.
c] conventionally.

2. Arrange each of the following groups of terms in order of their increasing Denotation and again in order of their increasing Connotation.

a] Quadruped, Animal, Substance, Elephant, Organic Thing, Indian Elephant, Vertibrate, and Mammals.
b] Book, History Text Book, Text Book, Modern Indian History Text Book.
c] Quadrilateral, Rectangle, Square, Area, Closed Area.

3. Describe the change in Denotation and Connotation of the following terms as you pass from one end to the other end of the series :

a) Element, Metal, Gold.
b) Creature, Animal, Man, Englishman.
c) Vehicle, Flying Vehicle, Aeroplane, Bomber, Jet Bomber.
d) Book, Printed Book, Dictionary, Latin Dictionary.

Subjective Type Questions

1. What do you understand by Denotation and Connotation of a term? What is the relation between the two ?
2. Give examples of Terms whose Denotation may increase without any change in the Connotation and also of terms whose Connotation may increase without any change in the Denotation.
3. Explain :—
   a) Increase or decrease in the Denotation or Connotation of a term gives rise to a new term.
   b) The inverse variation between Denotation and Connotation is not mathematically proportional.
4. How is Connotation of a term is determined ?
5. The students shall be asked to make a diagramatic representation of the relation between the Denotation and the Connotation of three terms.

সাধারণ বিবরণী

আনন্দের মাঝে কাজও যে কত মনোজ্ঞ হয়ে উঠতে পারে তারই এক সুন্দর দৃষ্টান্ত হয়ে রইল আমাদের এই গ্রীষ্মকালীন আলোচনা-চক্র। বিভিন্ন বিদ্যালয় থেকে আমরা ২২ জন শিক্ষয়িত্রী মিলিত হয়েছিলাম এই আলোচনা-চক্রে। যাঁদের আমরা দুদিন আগেও চিনতাম না, জানতাম না, মাত্র ক'দিনের পরিচয়ে, ক'দিনের মিলিত কাজের মধ্য দিয়ে কেমন করে যে সকলে পরস্পরের আপনজন হয়ে উঠলাম সে এক নতুন চেতনা। আমাদের উপদেষ্টা ছিলেন, নিজ নিজ বিষয়ে বিদগ্ধ ও সুপ্রতিষ্ঠিত চারজন শিক্ষাবিদ। তাঁদের সক্রিয় সাহায্য, উপদেশ ও নির্দেশই এই স্বল্পকালীন আলোচনা-চক্রকে সাফল্যমণ্ডিত করে তুলতে সাহায্য করেছে। উপদেষ্টাসুলভ গাম্ভীর্য নিয়ে তাঁরা দূরে সরে থাকেননি—তাই তাঁদের কাছ থেকে সাহায্য নেওয়া আমাদের এমন সহজ ও আনন্দের হয়ে উঠেছিল। আমরা যে উদ্দেশ্যে এখানে মিলিত হয়েছিলাম তা সম্পূর্ণ হয়েছে। উপরন্তু উপচয়ন হিসাবে যে আনন্দের অভিজ্ঞতা নিয়ে গেলাম তা বিদ্যালয়ের পঠন-পাঠনের মাঝে সঞ্চারিত করতে পারলে পাঠে ছাত্রীদের আগ্রহ বাড়বে সন্দেহ নেই।

আলিপুর হেষ্টিংস হাউসে অবস্থিত শিক্ষণ শিক্ষা মহাবিদ্যালয়ের শিক্ষা-সম্প্রসারণ বিভাগের উদ্যোগে প্রতি বছরই এ ধরনের অনুষ্ঠান হয়ে থাকে। এ বছর ১৭ই জুন থেকে ২৬শে জুন পর্যন্ত সময় এ উদ্দেশ্যে নির্দ্দিষ্ট হয়েছিল। ১৭ই জুন বেলা এগারোটায় শিক্ষণ-শিক্ষা মহাবিদ্যালয়ের অধ্যক্ষা ও সম্প্রসারণ বিভাগের পরিচালিকা শ্রীযুক্তা কল্যাণী প্রামাণিকের অভিনন্দন বাণী নিয়ে এ অনুষ্ঠান সুরু হয়। শিক্ষা সম্প্রসারণ বিভাগের Co-ordinator শ্রীযুক্তা অপরাজিতা রায় পরিচালক অধ্যাপক-বৃন্দের পরিচয় দানের পর এই অনুষ্ঠানের উদ্দেশ্য ও গুরুত্ব ব্যাখ্যা করেন। শিক্ষণীয় বিষয় কি ভাবে শিক্ষার্থীদের বুদ্ধিগ্রাহ্য ও হৃদয়গ্রাহী করে তোলা যায় সে সম্বন্ধেও তিনি সংক্ষিপ্ত আলোচনা করেন। শ্রীযুক্তা কল্যাণী প্রামাণিক মহাশয়া অধীত বিষয় ছাত্ররা কতখানি অনুধাবন করেছে ও এর দ্বারা কতটা উপকৃত হয়েছে সেটা জানার ওপর অধিক গুরুত্ব দেন।

অর্থনীতির অধ্যাপক শ্রীযুক্ত প্রবোধকৃষ্ণ দাশ মহাপাত্র এই ছাত্র অসন্তোষের যুগে এবং বর্তমান সামাজিক ও অর্থনৈতিক পরিবেশে শিক্ষা দানের ক্ষেত্রে শিক্ষকের দায়িত্ব ও কর্তব্য সম্বন্ধে সংক্ষিপ্ত আলোচনা করেন এবং এই প্রকার আলোচনা-চক্রের সপ্তাহকালীন ব্যাপ্তিকে অন্ততঃ পক্ষকালীন ব্যাপ্তিতে পরিবর্তিত করার প্রয়োজনীয়তার উল্লেখ করেন।

অধ্যাপক শ্রীযুক্ত সুধীরচন্দ্র রায় বলেন যে শিক্ষাদান (teaching) এবং শিক্ষাগ্রহণ ঠিকমতো হলে তার মূল্যায়ন (evaluation) স্বতঃস্ফূর্তভাবেই ঘটে। অর্থাৎ শিক্ষাদান, শিক্ষাগ্রহণ ও মূল্যায়ণ একটি অবিচ্ছিন্ন সম্পর্কের সামগ্রিক ব্যাপার। নৈর্ব্যক্তিক পরীক্ষা কি এবং কিভাবে গ্রহণ করা সম্ভব সে সম্বন্ধেও তিনি আলোচনা করেন।

এরপর অর্থনীতির অপর অধ্যাপক শ্রীযুক্ত কানাই বন্দ্যোপাধ্যায় পরিবর্তিত পরিবেশে অর্থনীতির নিয়ত পরিবর্তনের সঙ্গে শিক্ষকদের পরিচয় থাকার প্রয়োজনীয়তার উল্লেখ করেন। শিক্ষকদের জ্ঞানের দীনতা সম্বন্ধে সতর্ক হতে উপদেশ দেন। কি শিক্ষা দেওয়া হবে তা জানার পর কিভাবে শিক্ষা দিতে হবে তা জানা প্রয়োজন এবং সেই সঙ্গে কেন শিক্ষা দেওয়া হবে সে কথাও শিক্ষকের জানা প্রয়োজন।

তর্ক শাস্ত্রের অধ্যাপক শ্রীযুক্ত অমর বসু তর্কশাস্ত্র পড়ার উদ্দেশ্য ব্যাখ্যা করে প্রাত্যহিক জীবনের ব্যবহারে এর প্রয়োগের প্রয়োজনীয়তার উল্লেখ করেন এবং তর্কশাস্ত্রসম্মত দৃষ্টিভঙ্গীর অভাবের কতগুলি দৃষ্টান্তের সাহায্যে তাঁর বক্তব্য পরিস্ফুট করেন।

সর্বশেষে শ্রীযুক্তা অপরাজিতা রায় আলোচনা-চক্রের সাফল্য কামনা করেন ও সবাইকে শুভেচ্ছা জানান।

এরপর শিক্ষিকারা অর্থনীতি, তর্কশাস্ত্র ও বাংলা এই তিন বিষয়ানুসারে তিনভাগে বিভক্ত হয়ে পরিচালক অধ্যাপকদের সাহায্যে নিজ নিজ বিভাগের কাজ সুরু করেন।

আমাদের বাংলা বিভাগের পরিচালক অধ্যাপক শ্রীযুক্ত রায় প্রথমে ব্যাকরণ কি, বাংলা ব্যাকরণে অন্যান্য ব্যাকরণের প্রভাব, বাংলা ভাষার স্বাভাবিক ব্যাকরণের অভাব এবং এ বিষয়ে রাজা রামমোহন রায়ের অন্তর্দৃষ্টি সম্বন্ধে বিস্তৃত আলোচনা করেন। এই প্রসঙ্গে ব্যাকরণের সংজ্ঞা নিরূপণের অসুবিধা—কিভাবে বাংলা ব্যাকরণের সঙ্গে অন্যান্য ভাষার ব্যাকরণের সম্মেলন ঘটানো যায় এবং সাহিত্যের সঙ্গে ব্যাকরণের সম্পর্ক কি—প্রভৃতি বিষয়ও আলোচনা করেন।

১৮ই জুন শ্রীযুক্ত রায় বাংলা ভাষার কোন্ বিশেষ বিষয় নিয়ে আমরা কাজ করতে ইচ্ছুক আমাদের সঙ্গে আলোচনার মাধ্যমে তা স্থির করেন। ব্যাকরণের অসমাপিকা ক্রিয়া পর্য্যায় আলোচ্য বিষয় হিসাবে নির্দিষ্ট হয়। আমরা তিনভাগে বিভক্ত হয়ে এই বিষয়টির উপর কাজ সুরু করি। প্রথম বিভাগ "বাংলা ভাষা শিক্ষার উদ্দেশ্য", দ্বিতীয় বিভাগ "ব্যাকরণ পাঠের উদ্দেশ্য" ও তৃতীয় বিভাগ "বাংলা ভাষা ও সাহিত্যে অসমাপিকা ক্রিয়ার বৈশিষ্ট" সম্বন্ধে আলোচনা করে। আমাদের পরিচালক অধ্যাপক শ্রীযুক্ত রায় বিভিন্ন বিভাগের কাজ পরিদর্শন করে উপদেশ ও নির্দেশ দেন। এরপর তিনটি বিভাগের কাজ নিয়ে একত্র বসে আলোচনা করা হয় এবং পরবর্তী কাজ কিভাবে অগ্রসর হবে সে বিষয়ে পরিকল্পনা রচিত হয়।

১৯শে জুন—অসমাপিকা ক্রিয়া সম্বন্ধে আলোচনায় যে যে বইএর সাহায্যের প্রয়োজন তা অধ্যাপক রায় আমাদের জানান। অর্থনীতি, তর্কশাস্ত্র ও বাংলা বিভাগে এ দুদিনে যতটা কাজ অগ্রসর হয়েছে তার বিবরণী সকল বিভাগের শিক্ষয়িত্রী ও অধ্যাপকবৃন্দের সামনে পাঠ করা হয়। এই বিবরণীর উপর সাধারণ আলোচনার পর কিছু পরিবর্তন ও সংস্কার সাধনের উপদেশ দেওয়া হয়।

২০শে জুন—পূর্বদিনের আলোচনানুসারে বিবরণী (Report)-এর কিছু পরিবর্তন সাধনের পর আমরা কয়েকটি ভাগে বিভক্ত হয়ে বিষয়বস্তু (Content)-র উপর কাজ সুরু করি। দিনের শেষে সকলের কাজ একত্রিত করে একসঙ্গে আলোচনা করা হয়।

২১শে জুন—পূর্বনির্দিষ্ট বিভাগেই মূল্যায়ণ (evaluation)-এর উপর কিভাবে কাজ করলে সুবিধা হবে অধ্যাপক রায় তা আমাদের বুঝিয়ে দেওয়ার পর এ বিষয়ে কাজ কিছুটা অগ্রসর হয়।

এইদিন অপরাহ্ণে পরিচালক অধ্যাপকবৃন্দ এবং শ্রীযুক্তা রায় তাঁদের পক্ষ থেকে শিক্ষার্থী শিক্ষয়িত্রীদের জলযোগের ব্যবস্থা করেন। এর অভিনবত্ব আমাদের মুগ্ধ করে। নানারকম সরস আলোচনার ফাঁকে ফাঁকে শ্রীযুক্তা অপরাজিতা রায় কিছু কাজের কথাও বলে নেন। অনুষ্ঠানটি খুবই উপভোগ্য হয়ে উঠেছিল।

২২শে জুন—এই দিন থেকে মূল্যায়ন (evaluation)-এর উপর কাজ সুরু হয় পূর্বনির্দিষ্ট বিভাগ অনুযায়ী। অপরাহ্ণে মিলিত চক্রের বৈঠক বসে। সব কটি বিষয়ের এতদিনের কাজের বিবরণী পাঠ করা হয় এবং পরবর্তী কাজের পরিকল্পনার আভাস জানানো হয়।

২৩শে জুন—পূর্বনির্দেশানুযায়ী বিভিন্ন বিভাগে আমাদের বিষয়ের কাজ সুরু হয়।

এই দিন কাজের শেষে আমাদের ব্রিটানিয়া বিস্কুট কোম্পানী দেখতে নিয়ে যাওয়া হয়। আমরা বিস্কুট প্রস্তুতের বিভিন্ন বিভাগগুলি এবং প্রস্তুত প্রণালী দেখে খুব আনন্দলাভ করি।

২৪শে জুন—আমরা খুব দ্রুত কাজের সমাপ্তির দিকে অগ্রসর হতে থাকি। ছোট ছোট দলে নানাকাজ প্রায় নিরবচ্ছিন্ন ভাবে সারাদিন ধরে চলে। Skill, Evaluation, Attitude এবং chart প্রভৃতির কাজ করা হয়। দিনের শেষে এ পর্যন্ত সবকটি দিনের সম্মিলিত কাজের ওপর আলোচনার পর সমগ্র রিপোর্টটি তৈরী হয়।

২৬শে জুন—তিন বিভাগের অধ্যাপকবৃন্দ, শ্রীযুক্তা কল্যাণী প্রামাণিক, শ্রীযুক্তা অপরাজিতা রায় এবং সমাগত অতিথিবৃন্দের সম্মুখে অর্থনীতি, বাংলা ও তর্কশাস্ত্রের রিপোর্টগুলি পাঠ করা হয়। এরপর কলিকাতা বিশ্ববিদ্যালয়ের অধ্যাপক শ্রীযুক্ত কালীশঙ্কর গুপ্তের উপস্থিতিতে এবং কলিকাতা গার্লস একাডেমী বি, টি, বিভাগের অধ্যক্ষা শ্রীযুক্তা লতিকা গুপ্তার সভানেত্রীত্বে আমাদের আয়োজিত এক সংক্ষিপ্ত বিচিত্রানুষ্ঠানের পর এবারের এই আলোচনা-চক্র অনুষ্ঠানের পরিসমাপ্তি ঘটে।

আমাদের কর্মবহুল অথচ আনন্দমুখর দিনগুলি শেষ হল।

আলোচ্য বিষয় ঃ বাংলাভাষা ও সাহিত্যে অসমাপিকা ক্রিয়ার বৈশিষ্ট্য ও প্রয়োজনীয়তা

বাংলা সাহিত্য জগতে ব্যাকরণের দান অসীম। বাংলা ব্যাকরণ ব্যতীত বাংলা সাহিত্য সম্পূর্ণতা লাভ করিতে পারে না। সাহিত্যের মূলকথা যে আনন্দানুভূতি বা রসাস্বাদন তা ব্যাকরণ ব্যতীত বিকশিত হতে পারে না। আমরা দেখেছি, সাহিত্যের ক্ষেত্রে শব্দ ও অর্থকে বিশ্লিষ্ট করা যায় না—উভয়েই অবিচ্ছেদ্য। উভয়ের একত্রীকরণের মাধ্যমে সাহিত্য গড়ে ওঠে। এখানেই দেখা যাচ্ছে সাহিত্যে ব্যাকরণের প্রয়োজনীয়তা আছে। অতএব সাহিত্যের সহিত ব্যাকরণের যে নিগূঢ় সম্পর্ক রয়েছে এবিষয়ে নিঃসন্দেহ।

A পরিধি ঃ

চলমান জীবনের সঙ্গে ভবিষ্যৎ-বর্তমান ও অতীতের একটা যোগসূত্র রেখে চলা ভাবী নাগরিকের একান্ত কর্তব্য বলে মনে হয়; বিদ্যালয়ের মাধ্যমে শিক্ষিকার সহায়তায় শিক্ষার্থীদের এ বিষয়ে স্পষ্ট ধারণা গড়ে ওঠে। ভাষা চিন্তার ধারক, সেই ভাষাকে আয়ত্ত করা ও অন্যত্র প্রয়োগ করার ক্ষমতা বিকাশে ব্যাকরণ সহায়তা করে। এছাড়া শব্দের অর্থবোধ, শব্দচয়নের নৈপুণ্য ও শব্দের উপযুক্ত ব্যবহারে সাহায্য করে বাংলা ব্যাকরণ। সাধারণভাবে আমরা বাংলা ব্যাকরণ বলতে জানি "যাহার সাহায্যে বাংলা ভাষা শুদ্ধভাবে লিখতে, পড়িতে ও বলিতে পারা যায়" তাকেই। কিন্তু মাতৃভাষা হিসাবে বাংলা ব্যাকরণ সম্পর্কে এই সংজ্ঞা অস্পষ্ট বলে মনে হয়। কেবলমাত্র নির্ভুল রচনাই তো আমাদের উদ্দেশ্য নয়। বাংলা সাহিত্যের রূপ সৌন্দর্য ও বৈশিষ্ট প্রভৃতিকে নির্ভুলভাবে প্রকাশে সাহায্য করে থাকে বাংলা ব্যাকরণ। আমরা জানি লিখিত বাংলা ও কথ্য বাংলার প্রভেদ আছে—এর ফলে উভয়কে ভালভাবে জানতে হলে ব্যাকরণের সাহায্য নিতে হবে। চিন্তার সঙ্গে প্রকাশ ক্ষমতা কিভাবে সমন্বিত হয়েছে ব্যাকরণ শিক্ষার্থীদের সে বিষয়ের উপলব্ধিতে সাহায্য করে। প্রতীকধর্মী ভাষাকে প্রত্যক্ষ করার ক্ষমতাকে বাড়ায় ব্যাকরণ। এই বিষয়টি শিক্ষার্থীদের ভাষাও সাহিতের প্রতি আগ্রহী করে তোলে। পাঠকৌশল আয়ত্ত করতে ব্যাকরণ সাহায্য করে; যুগোপযোগী শব্দভাণ্ডার প্রয়োগে ভাষা রসোত্তীর্ণ ও মনোগ্রাহী হয়ে উঠেছে কিনা সে সম্বন্ধে ব্যাকরণ সন্ধানী দৃষ্টিভঙ্গী গঠনে সাহায্য করে। দেশী ওবিদেশী শব্দ প্রয়োগ সম্বন্ধে ব্যাকরণ কৌতুহলী করে তোলে। ব্যাকরণ শব্দকে বিজ্ঞানসম্মতভাবে বিশ্লেষণের ক্ষমতা দেয় ও বাক্যের অন্তর্ভুক্ত পদগুলির পারস্পরিক সম্পর্ক নির্ণয়ে সাহায্য করে।

আমরা দেখেছি বাংলা ব্যাকরণের ক্ষেত্রে বিভিন্ন ভাষার প্রভাব পড়েছে। বিশেষতঃ সংস্কৃত ও ইংরেজীর প্রভাব বাংলা ব্যাকরণে বিশেষভাবে পড়েছে। আবার এও আমরা দেখেছি যে, বাংলা ক্রিয়া

বিশ্লেষণের মধ্য দিয়ে সহজে ভাষাবোধ জাগ্রত হয়। কিন্তু এই ক্রিয়া সম্পর্কে শিক্ষার্থীদের মধ্যে প্রায়ই অস্পষ্ট ধারণা থাকতে দেখা যায়—বিশেষতঃ ক্রিয়ার একটি অংশ অসমাপিকা ক্রিয়া সম্পর্কে—ইয়া, ইতে, ইলে এবং যৌগিক ক্রিয়া প্রভৃতির ক্ষেত্রে। সেইজন্য বাংলা বিভাগে 'অসমাপিকা ক্রিয়াকে' আলোচ্য বিষয় হিসাবে গ্রহণ করা হয়। অন্যান্য ভাষায় ইতিপূর্বে অসমাপিকা ক্রিয়ার ব্যবহার আছে বটে, খাঁটি বাংলা ভাষায় এর ব্যবহার অনেক বেশি দেখা যায়। অনেকের এমনও ধারণা এই অসমাপিকা ক্রিয়ার বিভিন্ন ধরণ প্রচুরভাবে ব্যবহৃত হয়ে আসছে আড়াই হাজার বছর আগে থেকে। সাহিত্যে ভাব পরিবেশনের কাজে, ভাষায় সৌন্দর্য্যবৃদ্ধির উদ্দেশ্যে, অর্থের দ্যোতনা প্রকাশে, সময় ও পরিবেশের ব্যঞ্জনায় অসমাপিকা ক্রিয়ার সহযোগ অনস্বীকার্য। বাক্যে উদ্দেশ্যকে বিধেয়ের সঙ্গে যুক্ত করতে; বক্তার বক্তব্যকে একসূত্রে গ্রথিত করতে 'ক্রিয়া' সকল ভাষাতেই সংযোজকের কাজ করে থাকে। অবশ্য এর প্রকাশ কখনও কখনও অনুক্ত ভঙ্গীতেও হয়। অসমাপিকার মধ্যে এই অনুক্ত ভঙ্গীটুকুও সুন্দরভাবে থাকে।

প্রাচীন বাংলা সাহিত্যে দেখি কৃত্তিবাসের রামায়ণে, কাশীরাম দাসের মহাভারতে, ভারতচন্দ্রের অন্নদামঙ্গলে অসমাপিকার দৃষ্টান্ত আছে। পরবর্তী যুগে বঙ্কিমচন্দ্রের বিভিন্ন উপন্যাসে বর্ণনামূলক চিত্ররচনায় এই অসমাপিকা ক্রিয়ার অনেক দৃষ্টান্ত পাওয়া গেছে। 'আনন্দমঠ', 'দুর্গেশনন্দিনী' ইত্যাদির মধ্য থেকে সেগুলো আলোচনা করা যায়। রবীন্দ্রনাথ, শরৎচন্দ্র প্রমুখ সাহিত্যিকবৃন্দ তাঁদের সৃষ্ট রচনাতেও অসমাপিকা ক্রিয়ার ব্যবহার করেছেন। পরবর্তী রবীন্দ্রোত্তর যুগেও সাহিত্যে অসমাপিকা ক্রিয়ার সাহায্যে সময়ের গতিরোধ, মার্জিত সংলাপ রচনা, নাটকীয় সংঘাত সৃষ্টি, অসম্পূর্ণতার মধ্যে সম্পূর্ণতার ইঙ্গিত, ঘটনার পারম্পর্য রক্ষা এবং আসল বিষয়ের পূর্বাভাষ সৃষ্টি করা হয়েছে।

(B) (i) উদ্দেশ্যঃ—নিম্নলিখিত আলোচনার মাধ্যমে অসমাপিকা ক্রিয়ার উদ্দেশ্যকে পরিস্ফুট করা হয়েছে।

(১) ক্রিয়া পর্য্যায় যে একটি ঘটনার পরিচয় দেয় সে বিষয়ে ছাত্রদের বুঝতে সাহায্য করা।

(২) অসমাপিকা ক্রিয়া যে ক্রিয়া পর্য্যায়ের অর্থবোধের সঙ্গে সম্পৃক্ত, সে বিষয়ে বুঝতে সাহায্য করা।

(৩) ক্রিয়া সম্পাদকের সমস্ত পরিচয় যে ক্রিয়া পর্য্যায় দিয়ে থাকে সেই বিষয় বুঝতে সাহায্য করা।

(৪) ক্রিয়ার ঘটনাক্রম যেমন মানসিক প্রক্রিয়া, পেশী সঞ্চালন, শারীরিক গন্তব্যস্থলের প্রত্যাশা এইগুলি বুঝতে সাহায্য করা।

(৫) সমাপিকা ক্রিয়ার পূর্ববর্তী কার্য্য বুঝাতে সাহায্য করা। যেমন—বেজীকে দেখিয়া সাপটি পলাইল।

(৬) সমাপিকা ক্রিয়ার সমকালীন কার্য বুঝাতে সাহায্য করা।

(৭) রূপ অসমাপিকা ক্রিয়া হলেও অর্থকে সমাপিকা ক'রে বুঝাতে সাহায্য করে।

(৮) অসমাপিকা—ক্রিয়ার উদ্দেশ্য, প্রয়োজন ও পরিণামফল বোঝায়, সে বিষয়ের উপলব্ধিতে সাহায্য করে।

(৯) অসমাপিকা ক্রিয়া যে বাক্যের বিশেষ বক্তব্যস্থলে জোর দিয়ে থাকে তা নির্ণয় করতে সাহায্য করা।

(১০) বিশ্লেষণ কার্যের সহায়তার জন্য যে অসমাপিকা ক্রিয়া ব্যবহার করতে হয় তা জানতে সাহায্য করা।

(১১) বাক্যের গতি সৃষ্টি করতে অসমাপিকা ক্রিয়া ব্যবহৃত হয়, এ বিষয়ে অনুধাবন করতে সাহায্য করা।

(১২) একজনের কাজের উপর ও অপরের পরবর্তী কাজ নির্ভর করে এমন বোঝাতে যে অসমাপিকা ক্রিয়া ব্যবহার করা হয়—সেই কৌশল আয়ত্ত করতে সাহায্য করা।

(১৩) অসমাপিকা ক্রিয়া কর্তার কোন্ কাজে স্থিতি বোঝায়—বাক্য গঠনের এই প্রক্রিয়া আয়ত্ত করতে সাহায্য করা।

উপরিউক্ত আলোচনার মাধ্যমে বাংলা ভাষাও সাহিত্যে অসমাপিকা ক্রিয়ার উদ্দেশ্য ও কার্যকারিতা কি সে বিষয়ে আলোচনা করা হল।

B (ii) প্রয়োগ ক্ষমতা (Skill)

১। অসমাপিকা ক্রিয়া ও সমাপিকা ক্রিয়ার পার্থক্য বুঝতে পারে।

[(ক) "তখন সেই অন্ধকারের মধ্যে যেন দক্ষযজ্ঞ বাধিয়া গেল।"

(খ) "সংকীর্ণ নদীর পথে বাধিল সমর জোয়ারের স্রোতে আর উত্তর সমীরে।"

প্রশ্ন সংকেত—উপরিউক্ত বাক্য দুইটির চিহ্নিত ক্রিয়া দুইটি কোন পর্য্যায়ের তাহা উল্লেখ করতে বলা হবে।]

২। অসমাপিকা ক্রিয়া অব্যয়ের মতো হয়েও যে ক্রিয়ার অন্তর্গত তা বুঝতে সাহায্য করে।

[(ক) "শীতল বলিয়া ও চাঁদ সেবিনু ভানুর কিরণ দেখি!"

(খ) মাকে ভাত বাড়িতে বলিয়া আমি স্নানে গেলাম।

প্রঃ সং—বাক্য দুইটির চিহ্নিত শব্দের অর্থ পরিস্ফুট করতে বলা হবে।]

৩। অসমাপিকা ক্রিয়ার বাক্যে একটি কর্তা থাকে তা বুঝতে পারে।

[(ক) "এই সুযোগে একটা চোর নাকি ছুটিয়া পলাইতেছিল।"

প্রঃ সং—চিহ্নিত ক্রিয়ার কর্তা বের করতে বলা হবে।]

৪। অসমাপিকা ক্রিয়াযুক্ত বাক্যে দুইটি কর্তা থাকে তা বুঝতে সাহায্য করে।

[(ক) 'যতীনদা টিকিট হাতে উঠিয়া যাইতেই ছোড়দা "থু থু ফেলা" টিকিট পেশ করিল।'

প্রঃ সং—কর্তা দুইটির ক্রিয়া খুঁজতে বলা হবে এবং ক্রিয়া দুইটি কোন্ পর্যায়ের তা জিজ্ঞাসা করা হবে।]

৫। অসমাপিকা ক্রিয়াযুক্ত বাক্যে দুইটি ঘটনার মধ্যে যে পারম্পর্য থাকে তাহা বুঝিতে সাহায্য করে।

[(ক) "নেকড়েটা তাহাকে টানিয়া লইয়া গিয়া ভোজন করিতেছে…… ….।"

প্রঃ সং—পূর্বঘটিত কাজ কোন্‌টি এবং এই কাজটি কোন্ ক্রিয়ার উপর নির্ভরশীল এবং পরবর্তী কাজ কোন্‌টি ও তা কোন্ ক্রিয়ার উপর নির্ভরশীল, জিজ্ঞাসা করা হবে।]

৬। অসমাপিকা ক্রিয়া যে নিমিত্তার্থে ব্যবহৃত হয় তা বুঝতে পারে।

[(ক) "কবে তুমি আসবে বলে রইব না বসে।"

(খ) তাকে রোগীর কাছে থাকতে ব'লে আমি ডাক্তারখানায় গেলাম।

প্রঃ সং—চিহ্নিত শব্দ দুইটির অর্থ পরিস্ফুট করতে বলা হবে।]

৭। অসমাপিকা ক্রিয়া যে কার্যের নিরন্তরতা বোঝায় তা বুঝতে প্যারে।

[(ক) "চেয়ে চেয়ে শুধু চেয়ে রয়েছি পড়িয়া।"

সে পান চিবাইতে চিবাইতে আসিতেছে।

প্রঃ সং—ক্রিয়ার পৌনঃপুনিকতা এবং একই সঙ্গে একাধিক ক্রিয়া উদযাপনের যে বৈশিষ্ট সূচিত হচ্ছে তা পরিস্ফুট করতে বলা হবে]

৮। যৌগিক ক্রিয়ার ক্ষেত্রে পূর্বেরটি যে অসমাপিকা ক্রিয়ার রূপ হয় তা বুঝতে সাহায্য করে।

[(ক) "রহিল তোমার এ ঘর দুয়ার কেস্টারে লয়ে থাকো।"

(খ) "—কেহবা ডুব না দিয়া গামছায় জল তুলিয়া ঘন ঘন মাথায় ঢালিতে থাকিত।"

প্রঃ সং—মূলক্রিয়া বের করতে বলা হবে এবং তার মধ্য হতে অসমাপিকা ক্রিয়া বিছিন্ন করে দেখাতে বলা হবে।]

৯। প্রকৃত অসমাপিকা ক্রিয়া ও যৌগিক অসমাপিকা ক্রিয়া এই দুই-এর পার্থক্য বুঝতে পারে।

[(ক) সে পড়ে গেল (পতিত হইল)।

(খ) সে পড়ে গেল (পাঠ করিয়া গেল)।

প্রঃ সং—চিহ্নিত শব্দ দুইটির প্রয়োগবৈশিষ্ট পরিস্ফুট করতে বলা হবে।]

B (iii) Attitude : প্রতিন্যাস

(১) শিক্ষার্থীর ব্যাকরণপাঠে আগ্রহ ও অনুরাগ বৃদ্ধি পাচ্ছে। ব্যাকরণের সঙ্গে সাহিত্যের যে যোগ নেই এই ভ্রান্ত ধারণা দূর হবে।

(২) ছাত্রেরা বিভিন্ন সাহিত্যের রসাস্বাদনের প্রেরণা পায়। অসমাপিকা ক্রিয়ার খোঁজে আরও পুস্তকপাঠে সচেষ্ট হয়।

(৩) সহপাঠীদের সঙ্গে ব্যাকরণ নিয়ে আলোচনা করতে চায়। বিশ্লেষক দৃষ্টিভঙ্গী আয়ত্ব করে তারা অনুসন্ধিৎসু হ'য়ে ওঠে।

(৪) শব্দচয়ন ক'রে শব্দগুলিকে বাক্যে ব্যবহার এবং মনোভাব প্রকাশের সহায়ক হিসাবে ব্যাকরণ পাঠের গুরুত্ব অনুভব করে।

(৫) নিভু'লবাক্য রচনা করে।

(৬) অন্যান্য ভাষায় (ইংরাজী, সংস্কৃত ইত্যাদি) অসমাপিকা ক্রিয়ার সন্ধান করতে চায় ; এবং বাংলা ভাষায় এর রূপের সঙ্গে পার্থক্য বুঝে নেয় অর্থাৎ Transfer of Training এর কাজ হবে।

(C)

বিষয়বস্তুর বিশ্লেষণ—অসমাপিকার প্রয়োগ ও দৃষ্টান্তের বিশ্লেষণ : ইয়া, ইতে, ইলে—এই তিন ভাগে আলোচিত হবে।

(ক) 'ইয়া' যোগে অসমাপিকার প্রয়োগ : (১) ঘটনার পারম্পর্য বোঝাতে—"আমি সেই সেতু দিয়া নদীর পরপারে গিয়া একটি পরিষ্কার পরিচ্ছন্ন বাঙ্গলোতে বিশ্রাম করিলাম।"

(হিমালয় ভ্রমণ—দেবেন্দ্রনাথ)

—'নদীর পরপারে গিয়া' ঘটনার সঙ্গে 'বিশ্রাম করিলাম' ঘটনার পারম্পর্য রয়েছে।

(২) দ্বিত্ব প্রয়োগ—"সেদিনও দেখেছি ক্ষণে ক্ষণে তুমি
ছুঁয়ে ছুঁয়ে গেছ বনতল—" (আবির্ভাব—রবীন্দ্রনাথ)

—চলিত ভাষায় 'ছুঁয়ে ছুঁয়ে' এই অসমাপিকার সাধুভাষার রূপ পরিবর্তিত করলে দাঁড়ায় 'ছুঁইয়া ছুঁইয়া'। এখানে ঘটনার পৌনঃপুনিকতা বুঝাচ্ছে।

(৩) স্থিতি-জ্ঞাপক—"এ বিশ্বাস আমার জন্মেছে, শাস্ত্র পড়ে নয়, মন্ত্রের শক্তি চোখে দেখে।"

(মন্ত্রশক্তি—প্রমথ চৌধুরী)

—অসমাপিকা 'সাধুরূপ' 'দেখিয়া'>দেখে 'চলিতে' রূপান্তরিত। এখানে 'চোখে দেখে' এর যে বিশেষ এক অভিজ্ঞতা মনে চিরন্তন হয়ে গেল তার স্পষ্ট ইঙ্গিত 'দেখে' অসমাপিকার মধ্যে।

(৪) গতিশীলতা—"বালক বৃক্ষঝুরি নামাইয়া দিয়া, দিনে দিনে উঠিল বাড়িয়া"—(দৃষ্টান্তে ব্যবহারের উপযোগী করে পরিবর্তিত) (ঘর ও বাহির—রবীন্দ্রনাথ)

—বর্দ্ধিত হওয়ার মধ্যে গতিশীলতার আভাস রয়েছে।

(৫) ক্রিয়াজাত বিশেষণ স্থানীয়রূপে : "নয় বেঁচে থাকা ; এযেন আমরা বাঁচিয়া মরিয়া আছি "—

'আছি' ক্রিয়ার বিশেষণরূপে জীবন্মৃত অবস্থার বর্ণনায় ব্যবহৃত হয়েছে ; অথবা, 'কূলবধূ দ্রুত গেল লাজে চমকিয়া।"

(৬) সাপেক্ষ বুঝাতে—"লভিয়া আরাম আমি উঠিলাম
তাহারে ধরিল জ্বরে।"—(পুরাতন ভৃত্য—রবীন্দ্রনাথ)

—'উঠা' ক্রিয়ার কার্য্য 'আরামলাভ' করার ওপর নির্ভরশীল।

(৭) একইরূপ হলেও অর্থের দরুণ পদপরিচয় স্বাতন্ত্র্য :

(ক) "সুখের লাগিয়া এঘর বাঁধিনু অনলে পুড়িয়া গেল।" (অব্যয়)

(খ) সড়কিটি তার কব্জিতে লাগিয়া ছিটকাইয়া বাহির হইয়া গেল। (অসমাপিকা ক্রিয়া)

(৮) ক্রিয়াবাচক বিশেষ্য স্থানীয়রূপে—
"মুখ দেখিয়া বুঝি নাই তোমার কষ্ট।"

'বুঝা' ক্রিয়ার বিশেষ্য স্থানীয় 'মুখ দেখিয়া' অসমাপিকা ক্রিয়ার ব্যবহার।

(খ) 'ইতে'-যোগে অসমাপিকার প্রয়োগ :—(১) ক্রিয়ার কাল বুঝাতে ক্রিয়া বিভক্তিরূপে—তখনও আমি যাইতে থাকিব।

—ঘটমান ভবিষ্যৎ বোঝার জন্য যাইতে>ইতে বিভক্তিরূপে ব্যবহৃত হল।

(২) ক্রিয়ার উদ্দেশ্য বুঝাবার জন্য—মোহনবাগান দল খেলিতে আসিয়াছে। 'আসা' ক্রিয়ার উদ্দেশ্য 'খেলা করতে' অসমাপিকা ক্রিয়ার ব্যবহারের মধ্য দিয়ে বোঝান হয়েছে।

(৩) ক্ষমতা বা সামর্থ্য বোঝাতে—(যৌগিক ক্রিয়া)

"পারে না বহিতে নদী জলভার..........."

'জলভার' বহন করার সামর্থ্য নাস্তি বাচক অর্থে প্রয়োগ করা হচ্ছে।

(৪) কারণ সূচক প্রয়োগ—"বলিতে ব্যথা লাগে।"

—'ব্যথা লাগে' ক্রিয়ার কারণ হিসাবে 'বলিতে' অসমাপিকার সাহায্য নেওয়া হয়েছে।

(৫) দ্বিত্ব প্রয়োগে—পুত্রহারা মাতা কাঁদিতে কাঁদিতে অন্ধ হইয়া গেলেন।

—পৌনঃপুনিকতা বোঝাতে 'কাঁদা' অসমাপিকা ক্রিয়ার 'ইতে' যোগ করে ব্যবহৃত হয়েছে।

(৬) সময়বোধকরূপে—"সূর্য উঠিতেই প্রভাত হইল এবং অন্ধকার দূর হইল।"

—সময় বোঝাতে এবং অন্ধকার দূর হওয়ার সাপেক্ষরূপে ব্যবহার হল।

(৭) সমাপিকা ক্রিয়ার সমকালীন অর্থে—

"ঘটনার কথা বলিতে বলিতে চলিতেছিলেন।"

—'চলা' ক্রিয়ার সঙ্গে বলা ক্রিয়াও ঘটে চলেছে। সুতরাং সমাপিকা ক্রিয়ার সমকালীন অর্থে ব্যবহৃত হচ্ছে।

(৮) জোর দেওয়ার কাজে—ভৃগু বারবার বিফল হইয়াও সফল হইতে পারিতেছিলেন। ভৃগুর ব্যর্থতার চেয়ে চেষ্টার সাফল্যের উপর জোর দেওয়া হয়েছে।

(৯) ক্রিয়ার বিশেষণরূপে—"দেখিতে দেখিতে তরণী কূলে ভিড়িল।"

(১০) ঘটনার পূর্ববর্তিতা বোঝাতে—"বলিতে বলিতে নচিকেতার প্রত্যাখ্যানের সঙ্গে সঙ্গে সে রথ সে অপ্সরাবৃন্দ সকলই শূন্যে মিলাইয়া গেল।" (গল্পে উপনিষদ্)

(১১) সাপেক্ষ হিসাবে—"যদি বলতে তবে আসতাম।"

—'বলতে' সাধুরূপ বলিতে>বলতে চলিতরূপ। অসমাপিকা ক্রিয়ার সাহায্যে একটি কাজ আরেকটির উপরে নির্ভরশীল দেখাতে পারা যাচ্ছে।

(১২) ক্রিয়ার বিশেষ্যরূপে—"বেড়াইতে যাওয়া ভাল।"

—'ভ্রমণ' বিশেষ্যের বদলে বেড়াইতে অসমাপিকা ক্রিয়া ব্যবহৃত হল।

(গ) 'ইলে'যোগে অসমাপিকা ক্রিয়ার দৃষ্টান্ত—

(১) কার্য্যকারণসম্বন্ধ বোঝাতে—"জন্মিলে মরিতে হবে।" 'জন্ম' মৃত্যুর অধীন; জীবনের মধ্যে এই দুয়ের কার্যের সম্বন্ধ বোঝাতে অসমাপিকা ক্রিয়ার ব্যবহার করা হয়েছে।

(২) কালের পূর্ববর্তিতায়—এই চক্ষে ঘৃত বা জল পড়িলে তাহা আপনি আপনি চক্ষের প্রান্ত বহিয়া পড়িয়া যায়।—(গল্পে উপনিষদ্)

(৩) ক্রিয়ার কাল বিভক্তির সঙ্গে রূপগত ঐক্য—"একথা মানিয়া লইলে চলেনা।"—'কথা' মানার বিভক্তি হিসাবে 'লইলে' অসমাপিকার প্রয়োগ ঘটেছে।

(৪) সমাপিকার মত করে অসমাপিকার ব্যবহার—"তুমি দাঁড়িয়ে রইলে।"—এখানে চিত্র ধর্মিতাও যুক্ত হয়েছে।

(৫) নির্ভরশীলতা বা সাপেক্ষ—"ব্যবসায় শিক্ষা করিতে হইলে অফিস ঝাঁট দেওয়া হইতে আরম্ভ করিতে হয়।" (কার্ণেগীর উক্তি)।

(৬) স্থিতি বোধক—"অঘোরে বৃষ্টি পড়িলেও পৃথিবী শীতল হইল না।" সময়ের গতিশীলতা এখানে রুদ্ধ হয়েছে বলেই বোঝা যায়।

(৭) কথায় জোর দেওয়ার জন্য—"শুধু বলিলেই হয়না, করিয়াও দেখাইতে হয়।" —'বলিলেই' কথাটির ওপরে অধিক জোর দেওয়া হয়েছে।

(৮) মিশ্রবাক্যকে সরল বাক্যে পরিবর্তন করায়—"এখানে আসিলে সুখী হইবে।" অর্থাৎ যদি এখানে আসো তবে সুখী হবে বোঝাচ্ছে।

বহুক্ষেত্রে সমাপিকা ক্রিয়া অসমাপিকার ছদ্মবেশে আসে। সেগুলি সম্পর্কে সতর্কতা বাঞ্ছনীয়। দৃষ্টান্ত স্বরূপ—"একথা বলিলে কেন?"—'বলিলে' মনে হয় এটি-ইলে প্রত্যয়ান্ত অসমাপিকা ক্রিয়া। অর্থ বিশ্লেষ করলে দেখা যাবে এটি সমাপিকা ক্রিয়ারই রূপ। কর্তা 'তুমি' উহ্য থাকায় 'এ' বিভক্তির সঙ্গে এক লাগছে।

TEACHING HINTS : শিক্ষাদানের সংকেত :

কি শেখাব, কেন শেখাব এবং কেমন করে শেখাব এই তিন পর্যায়ের মধ্যে কেমন করে শেখাব অর্থাৎ শিক্ষাদানের পদ্ধতির দিকটা শিক্ষিকার কাছে সবচেয়ে গুরুত্বপূর্ণ। শ্রেণীকক্ষ তো শুধু যন্ত্রপাতি উৎপাদনের ক্ষেত্র নয়—এখানে শিক্ষিকাকে সজীব চঞ্চল ও অনুসন্ধিৎসু কয়েকটি ছাত্র-ছাত্রীকে নিয়ে কাজ করতে হয়—যাদের ব্যক্তি স্বাতন্ত্র্য আছে তাদের আবার সমষ্টিগত ঐক্যটুকুও রক্ষা করতে হবে। সুতরাং একেকে বহুর মধ্যে রাখার জন্য সহযোগিতামূলক মনোভাব বৃদ্ধি করা দরকার। তার সঙ্গে নিহিত সম্ভাবনার পরিস্ফুটনের দায়িত্বটুকুও পালন করে শিক্ষার্থীকে মাতৃভাষা শিক্ষার প্রতি আগ্রহী করে তুলতে হবে।

এই উদ্দেশ্যে শিক্ষার্থীদের কেন্দ্র করে পাঠদান সুরু করতে পারলে শিক্ষার্থীর মনে উদ্দীপনা জাগানো সহজ হবে। এতো গেল মনস্তাত্ত্বিক দিক। এই শিক্ষা গ্রহণ যে তার জীবনের কাজে লাগতে সমর্থ এটুকু জ্ঞান জন্মালে সে আপনার প্রয়োজনেই পাঠে আগ্রহী হবে। তখন শিক্ষিকা তার এই আগ্রহকে কাজে লাগাতে পারবেন।

এখানে আধুনিক শিক্ষাপদ্ধতির কয়েকটি নমুনা দেখানো যেতে পারে—

(ক) Workshop Method.

(খ) Project Method.

(গ) Lecture Method ইত্যাদি

আমাদের উপকরণ যেখানে ব্ল্যাকবোর্ড, চক্, ডাস্টার সেখানে সরল পদ্ধতি হিসাবে আমরা শ্রেণীকক্ষে পাঠপরিচালনামূলক প্রশ্নোত্তরের মধ্য দিয়ে শিক্ষাদানের কাজ চালাতে পারি। দৃষ্টান্ত হিসাবে অসমাপিকা ক্রিয়ার সংজ্ঞা নির্ণয় করতে এই তিনটি পদ্ধতির কিভাবে সমবায় ঘটানো যায় তার উল্লেখকরা হচ্ছে—।

Lecture Method এ—

সুনীতি বাবুর ব্যাকরণের সংজ্ঞা :

"যে ক্রিয়া-রূপের দ্বারা বাক্যের গঠন সম্পূর্ণ হয়না অর্থাৎ যে ক্রিয়ারূপের দ্বারা বাক্য পূর্ণাঙ্গ হয়না এবং বাক্যটির সমগ্রভাবে সার্থকও হয়না, বাক্যের গঠন ও সামগ্রিক অর্থের সম্পূর্ণতার জন্য একটি সমাপিকা ক্রিয়ার অপেক্ষা থাকে—তাহাকে বলে 'অসমাপিকা ক্রিয়া রূপ' বা সংক্ষেপে অসমাপিকা— যেমন 'এ কথা শুনিয়া তিনি বলিলেন।'

Project Method এ বিভিন্ন দৃষ্টান্তের সাহায্যে বোঝাতে হবে যে 'অসম্পূর্ণ ভাব প্রকাশ' কথাটি কি অর্থে ব্যবহার করা হয়েছে; একটি ভাব, না, সম্বন্ধযুক্ত বহুভাবের বিশেষ দিক; ঘটনাক্রমের কোন্ বক্তব্যটি প্রধান করবার জন্য মুলক্রিয়াপদের অসম্পূর্ণতা—ইত্যাদি।

Workshop Method এ তাদের বহু দৃষ্টান্ত সংগ্রহ করে এই সংজ্ঞার আভিধানিক 'অসম্পূর্ণ মনোভাব প্রকাশ' কথাটি যে আসলে ক্রিয়াপদের অন্তর্নিহিত 'ঘটনাক্রমের' নিরন্তরতা, ইচ্ছা, কার্যকারণ যোগ প্রভৃতি বোঝায় সেই বিষয় উপলব্ধিতে পরিচালনা করা হবে। এর জন্যে আমাদের ছবি, চার্ট ব্যবহার করা যেতে পারে। প্রয়োজনীয় বই হিসাবে রাজা রামমোহনের গৌড়ীয় ব্যাকরণ জগদীশ ঘোষের বাংলা ব্যাকরণ শ্রীসুনীতি কুমারের বাংলা ব্যাকরণ এবং বিভিন্ন পাঠ্য পুস্তকের সাহায্য নেওয়া হবে।

শিক্ষকের প্রস্তুতি :

যদিও খৃষ্টপূর্ব ৬০০ থেকে ২০০ এর মধ্যেই অসমাপিকা ক্রিয়া ব্যবহারের প্রাচুর্য ঘটে গেছে, কিন্তু খৃষ্টাব্দ দশম শতকের পূর্বে বাংলা সাহিত্যের নিদর্শন কিছু এখনও মেলেনি। সেইজন্য খাঁটি

বাংলাবাক্য গঠন যে সব সাহিত্যে পাওয়া যায় সেই গুলি থেকে অসমাপিকা ক্রিয়া সংগ্রহ করা হবে। এই উদ্দেশ্যেই নিম্নের সাহিত্য কৃতিগুলি পড়ে নেওয়া হল।

প্রাচীন যুগ
- (ক) কৃত্তিবাসী রামায়ণ
- (খ) পদাবলী সাহিত্য
- (গ) কাশারাম দাসের মহাভারত
- (ঘ) মঙ্গল কাব্য

আধুনিক যুগ
- (ঙ) রবীন্দ্র ও বঙ্কিম রচনাবলী
- (চ) শরৎ সাহিত্য
- (ছ) বাংলার নাট্য সাহিত্য
- (জ) আধুনিক সাহিত্য

এছাড়া ইংরাজী ও সংস্কৃত সাহিত্যে অসমাপিকা ক্রিয়ার ব্যবহার নিরূপণ করতে ইংরাজীতে Nesfield এর Grammar, সংস্কৃতে ব্যাকরণ কৌমুদী প্রভৃতি বই এর সাহায্য নিতে হবে।

ছাত্রেরা ক্রিয়ার নিহিত অর্থ সমাপিকা ক্রিয়া অধীত করেছে সেই অভিজ্ঞতা আলোচনা মাধ্যমে সেই বিষয়ে জেনে নিতে হবে।

Lesson Note বা পাঠ টীকা : (পরপৃষ্ঠায় নমুনা দেওয়া হল)

—পাঠ পরিকল্পনা—

তারিখ : ২৬/৬/৭০।	পাঠ ক্রম : বাংলা ব্যাকরণ
শিক্ষিকা : শেফালী মুখোপাধ্যায়।	বিষয় : ক্রিয়া
বিদ্যালয় : বালী বঙ্গশিশু বালিকা বিদ্যালয়।	বিশেষ বিষয় : (১) সমাপিকা— অসামাপিকার সংজ্ঞা
শ্রেণী : অষ্টম (ক বিভাগ)।	* ২) দুয়ের মধ্যে পার্থক্য
ছাত্রী সংখ্যা : ৪০ জন।	(৩) অসমাপিকার ক্রিয়া নিষ্পন্ন করতে—'ইয়া',—'ইতে',—'ইলে', প্রত্যয়ের ব্যবহার।
গড় বয়স : ১৪+বৎসর (গড়ে)।	
সময় : ৪৫ মিনিট।	*অদ্যকার পাঠ বিষয়

উদ্দেশ্য

ক { (১) ভাষা গঠনে ব্যাকরণের সহযোগিতা বুঝিয়ে ছাত্রীদের ব্যাকরণ শিক্ষাকে সাহিত্যমুখী করা।

(২) বাক্য গঠনের কাজে উদ্দেশ্য ও বিধেয়ের মধ্যে সংযোগ সাধনের জন্য ক্রিয়ার গুরুত্ব সম্পর্কে ছাত্রীদের সচেতন করা।

খ (৩) ব্যাকরণের মধ্যে বক্তার মানসিকতা যে কত ভাবে লুকানো আছে, আলোচনার মাধ্যমে ছাত্রীমনে সেই বোধ জাগাতে সাহায্য করা।

উপকরণ

চক, ডাস্টার ও ব্ল্যাকবোর্ড ; সম্ভবস্থলে অসমাপিকা ও সমাপিকা ক্রিয়ার বিশ্লেষণ-মূলক প্রতীক চিত্র, অথবা কোনও চার্ট—যেখানে অসমাপিকার উৎসমুখ থেকে পরিণতির শেষ পর্যায়ের তালিকা রাখা আছে,

[উপকরণ হিসাবে এইসব শ্রেণী কক্ষে ব্যবহার করা গেলে শিক্ষাদান কাজ সহজ হবে।]

আয়োজন

ছাত্রীদের পাঠে মনোযোগী করার উদ্দেশ্যে শিক্ষিকা তাদের পূর্বজ্ঞানের ভিত্তিতে নীচে লেখা প্রশ্নের সাহায্য নেবেন : ("আমার আস্‌তে দেরি হয়ে গেল, ডাক্‌লে না কেন ?"— এই কথাটিকে নিয়ে বলবেন) (১) বাক্যের প্রধানতঃ কটি অংশ ?

(২) উদ্দেশ্যকে বিধেয়ের সঙ্গে যুক্ত করে কে ?

(৩) ক্রিয়ার সংজ্ঞা কি ? যে বাক্যটি বলা হল তার মধ্যে ক্রিয়া কোনটি ?

পাঠঘোষণা

উপরে লেখা প্রশ্নের মধ্য দিয়ে ছাত্রীদের পাঠে আগ্রহী করে তোলার পর শিক্ষিকা নির্বাচিত পাঠের ঘোষণা করবেন ঃ

ক্রিয়া দিয়ে বাক্যের অর্থ সম্পূর্ণ হয় ; কিন্তু ক্রিয়ার এমন রূপও দেখা যায় যাতে অসম্পূর্ণ অর্থ প্রকাশিত এবং উদ্দেশ্য, বিধেয় ক্রিয়ার বিশেষণ রূপে কিংবা ক্রিয়ার অর্থের বিবক্ষায় দেওয়ার কাজে ইত্যাদিতেও ক্রিয়ার বিশেষরূপ পরিবর্তন করা হয়েছে, তাকেই বলা হয় 'অসমাপিকা ক্রিয়া"—। আমরা আজ এই অসমাপিকা ক্রিয়ার সেই দিকগুলি সম্পর্কেই আলোচনা করব।

উপস্থাপন

আলোচনায় সুবিধার জন্য শিক্ষিকা তাঁর বিষয়কে কয়েকটি অংশে ভাগ করে আলোচনামূলক প্রশ্ন ও উত্তরের সাহায্যে পাঠদান কাজ সম্পন্ন করবেন ঃ

বিষয়	পদ্ধতি
বাক্য সমাপ্ত করার বিচারে ক্রিয়াকে দুই ভাগে ভাগ করা যায়। সমাপিকা এবং অসমাপিকা।	(১) বাক্য সমাপ্ত করতে হলে ক্রিয়াকে কটি ভাগে ভাগ করা যায় ? (২) তাদের নাম কি ?
অসমাপিকা ক্রিয়ার সংজ্ঞা উল্লেখ করতে হলে বলা যায়—যে ক্রিয়াপদ বাক্যের অর্থ সম্পূর্ণ করেনা তাই অসমাপিকা ক্রিয়া।	(৩) অসমাপিকা ক্রিয়া কি ?
বাংলা ভাষায় অসমাপিকা ক্রিয়া তিনটি প্রত্যয়ের সঙ্গে যুক্ত করা হয়। এই তিনটি প্রত্যয় হচ্ছে—ইয়া,—ইতে ও—ইলে।	(৪) কি কি প্রত্যয় যোগে অসমাপিকা ক্রিয়া গঠিত হয়ে থাকে ?
অসমাপিকা ক্রিয়ার সাহায্যে ঘটনার পূর্ববর্তিতা, গতিশীলতা, পৌনঃপুনিকতা, ক্রিয়াজাত বিশেষণরূপে, সাপেক্ষ. অব্যয়রূপে বিভিন্নভাবে মনের ভাব প্রকাশ করা যায়।	(৫) কোন্ কোন্ বিষয়ে আমরা অসমাপিকা ক্রিয়ার সাহায্য পেতে পারি ? দু একটার কথা উল্লেখ কর।
ইংরাজী ও সংস্কৃতের মধ্যে এই অসমাপিকা ক্রিয়ার ব্যবহার লক্ষ্য করা যায়।	(৬) আর কোন্ কোন্ ভাষায় এই অসমাপিকা ক্রিয়ার ব্যবহার দেখা যায় ?

অভিযোজন

"অসমাপিকা ক্রিয়া" সম্পর্কে দু একটা দৃষ্টান্ত উল্লেখ ও বিশ্লেষণ করে অভিযোজন কাজটি সমাপ্ত করা যাবে।	(১) —ইয়া, ইতে এবং—ইলে, যোগে অসমাপিকা ক্রিয়ার দু-একটা দৃষ্টান্ত দাও। (২) সমাপিকা ক্রিয়াকে অসমাপিকা ক্রিয়া রূপে বাক্যে ব্যবহার কর।

বোর্ডের কাজ

(১) কর্ অথবা চল্ ধাতুর সঙ্গে প্রত্যয়—ইয়া, —ইতে এবং—ইলে যুক্ত করে যে অসমাপিকা ক্রিয়া গঠিত করা যায় তা ছাত্রীদের দিয়ে বোর্ডে লেখান হবে।

দৃষ্টান্ত : (১) কর্+ইয়া= ?	(৪) চল্+ইয়া= ?	সাধুরূপ থেকে
(২) কর্+ইতে= ?	(৫) চল্+ইতে= ?	চলিতের রূপ লেখ।
(৩) কর্+ইলে= ?	(৬) চল্+ইলে= ?	

গৃহ কাজ

শিক্ষিকা সমাপিকা এবং অসমাপিকা ক্রিয়ার মধ্যে পার্থক্যগুলির একটা সংক্ষিপ্ত আলোচনা লিখে আনার জন্য নির্দেশ দেবেন।

(D) Teaching-Hints (শিক্ষাদানের সংকেত)

Discussions (আলোচনা)

শিক্ষিকা ছাত্রীদের সঙ্গে অসমাপিকা ক্রিয়ার প্রয়োগের প্রয়োজন আছে কি না— এই প্রসঙ্গে বিতর্কমূলক আলোচনা করতে পারেন। "মনের ভাব প্রকাশে সমাপিকা ক্রিয়াই যথেষ্ট ; অসমাপিকা ক্রিয়া বাহুল্য বোধে পরিত্যক্ত হওয়া উচিত।"

ছাত্রীদের পক্ষে ও বিপক্ষে দুটি দলে ভাগ করে নিয়ে যুক্তির প্রয়োগ ও বিশ্লেষণ করতে বলা হবে।

দৃষ্টান্ত : (১) যে সংকেত ধর্মিতা অসমাপিকা ক্রিয়ার সাহায্যে বাক্যের মধ্যে সৃষ্টি করা হয়, সমাপিকা ক্রিয়ায় সেই অস্পষ্টতার সৌন্দর্য নেই। যেমন, ট্রেন চলে গেল, আমি রইলাম দাঁড়িয়ে—এই "দাঁড়িয়ে" কথাটির সাহায্যে বক্তব্যের রেশ টুকু বহু দূরের দিকে সংকেত রাখে। (পক্ষে)

(২) এই আলোচনার বিরোধিতা করবে যারা অসমাপিকার বিরুদ্ধে। একথা সমাপিকার সাহায্যেও করা যায়—। যেমন "ট্রেন চলল, আমি দাঁড়ালাম।" (বিপক্ষে, ইত্যাদি।

আলোচনায় বক্তব্য বিষয়ের ধারণা জন্মায়, স্বচ্ছ দৃষ্টি ভংগী ও বিচার শক্তি জাগ্রত হয়। শিক্ষিকা ও ছাত্রীদের মধ্যে বন্ধুত্বের সম্পর্ক গড়ে ওঠে, ভয় দূর হয়।

অসমাপিকা ক্রিয়া শিক্ষাদানের ক্ষেত্রে প্রধানতম সমস্যাগুলি বা Major Problems :—

(১) বয়সের মাপকাঠি অনুযায়ী ব্যাকরণ বিষয়ের চিন্তাস্তর ভেদে পাঠক্রম সুনির্দিষ্ট না থাকায় শিক্ষিকা এবং শিক্ষার্থী উভয়েরই ব্যাকরণ পড়ানো বা শেখার বিশেষ সমস্যা বলে মনে হয়।

(২) ভাষা বিষয়ের বই অধিক না থাকার জন্য শিক্ষিকার পক্ষে বিষয়ের ওপরে বিস্তারিত ভাবে আলোচনায় বাধা সৃষ্টি হয়।

(৩) সময়ের স্বল্পতা : কলেজীয় শিক্ষায় ব্যাকরণের "বাক্য গঠন", "পদ-প্রকরণ" ইত্যাদি সম্পর্কে পাঠ্যসূচী না থাকায় স্কুল জীবনেই এই বিষয়ে প্রাথমিক শিক্ষা জাগ্রত করতে গিয়ে শিক্ষিকা সময়ের স্বল্পতা অনুভব করেন।

(৪) অন্যান্য বিষয়ের মতই ব্যাকরণ পঠনের সময় সমভাবে বন্টিত হয়—ফলে, ব্যস্ততার মধ্যে শিক্ষিকাকে ব্যাকরণ পাঠদান করতে গিয়ে অসুবিধায় পড়তে হয়।

(৫) বর্তমানে বর্ধিত ছাত্রীসংখ্যার জন্য প্রত্যেক ছাত্রীর প্রতি শিক্ষিকার পক্ষে বিশেষ দৃষ্টি দেওয়া সম্ভব হয় না।

Comments বা অতিরিক্ত আলোচনা

প্রতিবৎসর শিক্ষা সম্প্রসারণ বিভাগ বিভিন্ন শিক্ষিকাদের বিভিন্ন বিষয়ে বিশেষ জ্ঞানে সহায়তা করে থাকেন। বিদ্যালয়ে শিক্ষিকাদের ব্যাকরণের বিভিন্ন অংশ পাঠদানের সময় অনেক অসুবিধার সম্মুখীন হতে হয়। এই বিভাগ আমাদের সেই অসুবিধাগুলি থেকে মুক্ত করার চেষ্টা করে। অসমাপিকার পাঠদানের সময় যে অসুবিধা হত তা থেকে অনেকটা মুক্তি পেলেও ব্যাকরণের প্রত্যয়, সন্ধি ইত্যাদি বিষয়ের আলোচনা করার প্রয়োজন আছে বলে মনে হয়। এই বিভাগের পরিচালনায় যে পত্রিকা প্রকাশিত হয় সেই পত্রিকায় মাঝে মাঝে অভিজ্ঞ ব্যক্তিদের দিয়ে ব্যাকরণের বিশেষ আলোচনা হলে আমাদের পঠন-পাঠনের বিশেষ উপকার হতে পারে।

E মূল্যায়ন

যে কোন কারণেই হোক 'মূল্যায়নের' উপর আমরা বড় বেশি গুরুত্ব আরোপ করেছি। সঙ্গে সঙ্গে 'মূল্যায়ন' একটি পৃথক প্রক্রিয়া হয়ে পড়েছে। শিক্ষাদানের স্বাভাবিক ক্ষেত্র থেকে মূল্যায়ন অবাঞ্ছিত ভাবে সরে এলেও, শিক্ষার স্বভাব হিসাবে তাকে অস্বীকার করবার উপায় নেই। কারণ মূল্যায়নের সাহায্যে আমরা শিক্ষকের শিক্ষাদানের সামর্থ্য, শিক্ষার্থীর গ্রহণ যোগ্যতা ও সমগ্র শিক্ষার সার্থকতা বিচার করতে পারি। প্রচেষ্টাকে সহজ ও সুন্দর করে তুলতে নিম্নলিখিত কয়েকটি পদ্ধতির উল্লেখ করা যেতে পারে।

১। রচনা ধর্মী প্রশ্ন :—

(ক) অসমাপিকা ক্রিয়ার সংজ্ঞাটির যাথার্থ্য নিরূপণ কর।

(খ) সাধারণ ক্রিয়া বিভক্তির সঙ্গে অসমাপিকা ক্রিয়া বিভক্তির স্বাতন্ত্র্য কি ?

(গ) সমাপিকা ক্রিয়া বর্জন করে অসমাপিকা ক্রিয়া যুক্ত বাক্য গঠন করা যায় না কেন ?

(ঘ) সমগ্র বাক্যে দুইটি কর্তা ব্যবহার করে একটি কর্তা অসমাপিকা ক্রিয়া ভিন্ন সমাপিকা ক্রিয়া গ্রহণ করে নি এমন একটি দৃষ্টান্ত দাও।

২। নৈর্ব্যক্তিক প্রশ্ন :—

নীচের প্রশ্নগুলির সম্ভাব্য উত্তর পড়ে যেটি তোমার ঠিক মনে হবে তার ডান দিকের বন্ধনীর মধ্যে √ চিহ্ন দাও :—

একেলা জগৎ ভুলে পড়ে আছি নদীকূলে
পড়েছে নধর বট হেলে ভাঙা তীরে।

'ভুলে' শব্দটি অসমাপিকা ক্রিয়া ; কারণ,

(ক) ভুল শব্দটির সঙ্গে 'এ' বিভক্তি যুক্ত হয়েছে। ( )

(খ) ভুল ক্রিয়াপদটির সঙ্গে 'ইয়া' প্রত্যয় যুক্ত হয়েছে। ( )

(গ) ভুল ক্রিয়াপদটির সঙ্গে 'ইয়া' যুক্ত হয়ে চলতি ভাষায় পরিবর্ত্তিত হয়েছে। ( )

২। 'পড়ে' অসমাপিকা ক্রিয়া ; কারণ,

(ক) সমাপিকার পূর্ব ক্রিয়াপদটি অসমাপিকা হয়। ( )

(খ) যৌগিক ক্রিয়ার অসমাপিকা ক্রিয়া প্রধান অর্থবহ অংশটি গ্রহণ করে। ( )

(গ) 'পড়ে আছি'—এই যুগ্ম শব্দে 'আছি' 'আছি+ইয়া'—এর সংক্ষিপ্ত রূপ। ( )

৩। (ক) 'হেলে' শব্দটি অসমাপিকা ক্রিয়া ; কারণ,
'হেলে সাপ' বলতে যেমন 'হেলে' বিশেষণ এখানেও তেমনি বিশেষণ। ( )

(খ) 'হেলে' অসমাপিকা ক্রিয়া কারণ 'হেলে পড়েছে' এই যৌগিক ক্রিয়ার পূর্ব অংশে 'ইয়া' >এ যুক্ত হয়েছে। ( )

৪। দূরেতে পথিক দুটি চলে যায় গুটি গুটি
মেঠো পথ দিয়া।

'যায়'-এর সঙ্গে 'চলে' শব্দটিতে অসমাপিকা ব্যবহার করা হয়েছে কারণ—

(ক) 'চল্' ধাতুটির সহিত 'এ' বিভক্তি যুক্ত হয়েছে। ( )

(খ) 'চলে যায়' যৌগিক ক্রিয়ার অসমাপিকা রূপটি প্রধান অর্থবহ অংশই গ্রহণ করে। ( )

(গ) 'গুটি গুটি' শব্দ থাকার জন্য 'চলে' ক্রিয়াবিশেষণ ধরা হয়েছে। এর সাহায্যে গুটি গুটি অর্থটি প্রত্যক্ষ হয়ে ফুটে উঠেছে।

৫। দূর মাঠ-পানে চেয়ে(১) চেয়ে চেয়ে(২) শুধু চেয়ে(৩)
রয়েছি পড়িয়া।

উপরের পংক্তিটির মধ্যেকার 'চেয়ে' পদটির নম্বরের সহিত পাশের অর্থগুলির যেটি উপযুক্ত তার ডানদিকের বন্ধনীর মধ্যে নম্বরটি বসিয়ে দাও।

(১) চেয়ে	(ক) চিত্রার্পিতের মতো তাকানো ( )
(২) চেয়ে চেয়ে	(খ) হঠাৎ তাকানো ( )
(৩) চেয়ে	(গ) নিরন্তর আগ্রহে তাকানো ( )

৬। খসে খসে পড়ে পাতা মনে পড়ে কত গাথা—
ছায়া-ছায়া কত ব্যথা ঘুরে ধরা ধামে।

উপরের পঙ্‌ক্তিটি পড়ে নাও। 'খসে খসে' আর 'ছায়া-ছায়া' এই শব্দ যুগলকে লক্ষ্য করে নীচের প্রশ্নগুলির মধ্যে যেগুলি ঠিক বলে মনে হবে তার বাম দিকে □ এইরূপ চিহ্ন দাও :

(ক) 'খ'সে খ'সে' আর 'ছায়া-ছায়া' একই রূপে দ্বিত্ব হয়েছে।

(খ) 'খ'সে খ'সে' অসমাপিকা ক্রিয়া কিন্তু 'ছায়া-ছায়া' তা নয়।

(গ) 'খ'সে খ'সে' পড়া না বলে 'খসে পড়া' লিখলেই চলতে পারত, কিন্তু ছন্দের জন্য দ্বিত্ব করতে হয়েছে।

(ঘ) 'খেতে খেতে কথা বলছে' বাক্যটির 'খেতে খেতে' অসমাপিকা যেরূপ কালবোধ জাগায়, 'খসে খসে' অসমাপিকাও অনুরূপ কালবোধ জাগায়।

(ঙ) একই পাতা বারবার খসে পড়ছে তাই 'খসে' ক্রিয়াপদটির দ্বিত্ব করা হয়েছে।

৩। চিত্রলিপির সাহায্যে :—

একটি ছবিতে প্রতীক হিসেবে অসমাপিকা ক্রিয়া গঠনের রূপ দেওয়া হয়েছে। ছাত্রীদের ঐ ছবি দেখে সমাপিকা গঠন প্রণালীর একটি সংক্ষিপ্ত বিবরণ লিখতে বলা হবে।

সহায়ক পুস্তক (Reference Materials)

(১) গৌড়ীয় ব্যাকরণ ... রাজা রামমোহন রায়।

(২) ভাষা প্রকাশ বাংলা ব্যাকরণ ... ডঃ সুনীতি কুমার চট্টোপাধ্যায়।

(৩) ভাষার ইতিবৃত্ত ... সুকুমার সেন।

(৪) আধুনিক বাংলা ব্যাকরণ ... জগদীশ চন্দ্র ঘোষ।

(৫) বাংলা পড়ানোর নূতন পদ্ধতি ... সুধীর চন্দ্র রায়।

(৬) পাঠ সংকলন ... পশ্চিম বঙ্গ মাধ্যমিক শিক্ষা পর্ষদ।

(৭) পত্রিকা :— শিক্ষা, শিক্ষক, Teachers' World ইত্যাদি।

SUMMER VACATION COURSE

17th June—26th June 1970

Name of the Participants		*School*
BENGALI		
1. Shefali Mukherjee	...	Bally Banga Sishu Balika Vidyalaya
2. Bandana Roy	...	Barasat Girls' H. S. School
3. Mrinal Roy	...	Salkia Sabitri Balika Vidyalaya
4. Manjari Debsarma	...	" "
5. Debjani Majumdar	...	Sarsuna Girls' High School
6. Maya Ghosal	...	Sakhawat Mem. Govt. Girls' School
7. Madhabi Banerjee	...	Sri R. K. V. Nari Siksha Mandir, Mathurapur
8. Bandana Parua	...	Contai Chandramani Brahma Girls' H. School
9. Anita Dey	...	Barapalashan Girls' High School, Burdwan
10. Puspa Banerjee (Das Gupta)	...	Chandravag S. K. Girls' H. S. School
11. Bharati Mukherjee	...	Park Circus Girls' H. S. School
12. Bela Chakraborty	...	Howrah Ramkrishna Adarsha Balika Vidyalaya
13. Santwana Banerjee	...	Behala Girls' High School
LOGIC		
1. Nilima Das	...	Bally Banga Sishu Balika Vidyalaya
2. Lekha Giri	...	Bhupatinagar Kanya Vidyalaya
3. Mukul Das	...	Sonamukhi Girls' High School
4. Krishna Datta	...	Chandravag Srikrishna Girls' H. .S School
5. Sudeshna Mitra	...	Sakhawat Mem. Govt. Girls' School
6. C. J. Hema	...	Seth Soorajmall Jalan Balika Vidyalaya
ECONOMCIS		
1. Tapati Bhattacharya	...	Bagnan Girls' High School
2. Pranati Goswami	...	Bally Banga Sishu Balika Vidyalaya
3. Ratna Jana	...	Chandramoni Brahmo Girls' School